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ABSTRACT

The objective of this book is to provide background information and possible teaching approaches to enable teachers to tackle the study of trees confidently. The book should help students to: (1) gain awareness, sensitivity, and basic understanding of trees and their interactions with the plants and animals in their environment; (2) cultivate skills necessary to learn about trees; and (3) develop a concern for trees. Topics include: the basic definition of a tree; the importance of trees; care for trees; interesting facts about trees; parts of a tree; and special functions of tree parts (bark, leaves, flowers, seeds). Suggestions for a wide range of activities suitable for children of different ages make up the greater part of the book. Activities include using the senses, matching attributes of leaves, recording observations, writing poems, doing puzzles, taking measurements, arts and crafts connected with trees, basket weaving, music and sounds made by or by means of trees, identification of different kinds of trees, and designing a tree's food web. A resource list for posters, books, magazines, filmstrips, films, and videos is appended. Each resource entry includes the title/author or publisher, description, grade level, and availability. The book is abundantly illustrated with photographs, drawings, and other graphics. (KR)

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Jacob
age 10

A. B. CAUDELL, Government Printer, Tasmania

TREES

A BOOK OF RESOURCE IDEAS
FOR THE TEACHER

EDUCATION DEPARTMENT TASMANIA AUSTRALIA

ACKNOWLEDGMENTS

This book was compiled by Nel Smit with assistance from Jan Parris, Gill Watson, Peter Blackwell and Trish Armstrong, members of the Greening Australia (Tas.) Education Sub-committee, and the many teachers and children who have worked with the ideas and proved their success.

Acknowledgments and thanks also are due to Peter Osborne for his contribution to the original document, Catherine Pile (weaving), Rod Cooper (Tarzan's Travel), Christine Moore (paper-making), Alan Gray (plant propagation advice) and the Forestry Commission and National Parks and Wildlife Service for their photographs.

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FOREWORD

The world is becoming desperately short of trees and plants and many more trees are still being destroyed than planted each day. In fact, somewhere in the world 20-25 hectares are cleared of trees every minute, every day, every week.

Trees and plants change carbon dioxide into oxygen for us to breathe and if the loss of trees continues, the human race will become short of oxygen, which, of course, is absolutely vital to its existence. This lack of oxygen may not greatly affect the present generation, but in generations to come people will be as short of breath in Tasmania as climbers are now when half-way up Mt Everest.

Carbon dioxide is rapidly building up in the atmosphere. The increase is roughly one per cent per year and as this build-up continues, there will be serious effects on our weather patterns.

The United Nations Association of Australia took note of these disturbing facts and, with the aid of the Commonwealth Government, gave birth to the organisation which started out as The Year of the Tree and now (because of the immense tasks involved) has become the Decade of the Tree for Greening Australia, or Greening Australia for short.

The aims of Greening Australia are (1) To create greater public awareness of the value of trees (2) To arrest Australia's disturbing rate of tree decline (3) To promote, co-ordinate and carry out effectively planned tree-planting and maintenance programmes.

If the tide of tree loss is to be turned, much of the burden will fall on the next generation, and it is through education and through schools that this can be best and most easily achieved. The Greening Australia Committee in Tasmania has therefore produced this book which will help to show citizens of the future some of the reasons why we must all look after the trees we have, and plant more trees.

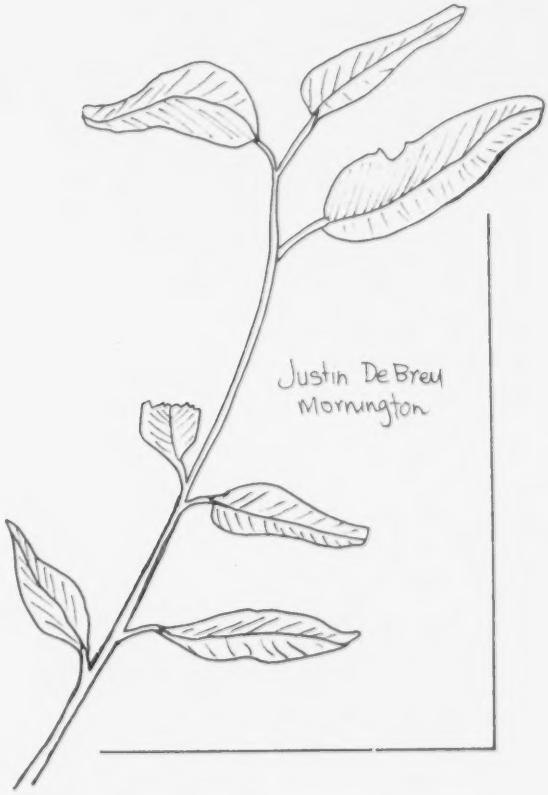
A lot of voluntary work has gone into this book and the effort will be well worthwhile if some of those who will control Tasmania and Australia in years to come realise the need for caring for our trees, not only for their beauty, their shelter and the food they give us, but because without the trees that we have got, and a vast increase in the number of trees in Australia and the world as a whole, the human race will die out.

I would like to express my gratitude to those members of the Greening Australia Committee who have spent so long and have put so much effort into preparing this book, and I also would like to thank the Education Department for its help with the preparation and the printing.

Dr Michael Readett
Chairman
Greening Australia (Tas.) Committee

Vanessa Wilton

Adrian
Evans
Mornington



Justin De Breu
Mornington

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Tasmanian rainforest.

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INTRODUCTION

This book has been produced in response to the Year of the Tree, which was initiated by the UNAA on World Environment Day in June 1982.

Trees play an important part in our lives. For educators they provide a ready source of material for observation and investigation.

The growing awareness of teachers of the importance of trees for our very survival has led to numerous requests for a compilation of activity ideas to 'get kids going'. Therefore the objective in preparing this book is to provide background information and possible teaching approaches to enable teachers to tackle the study of trees confidently.

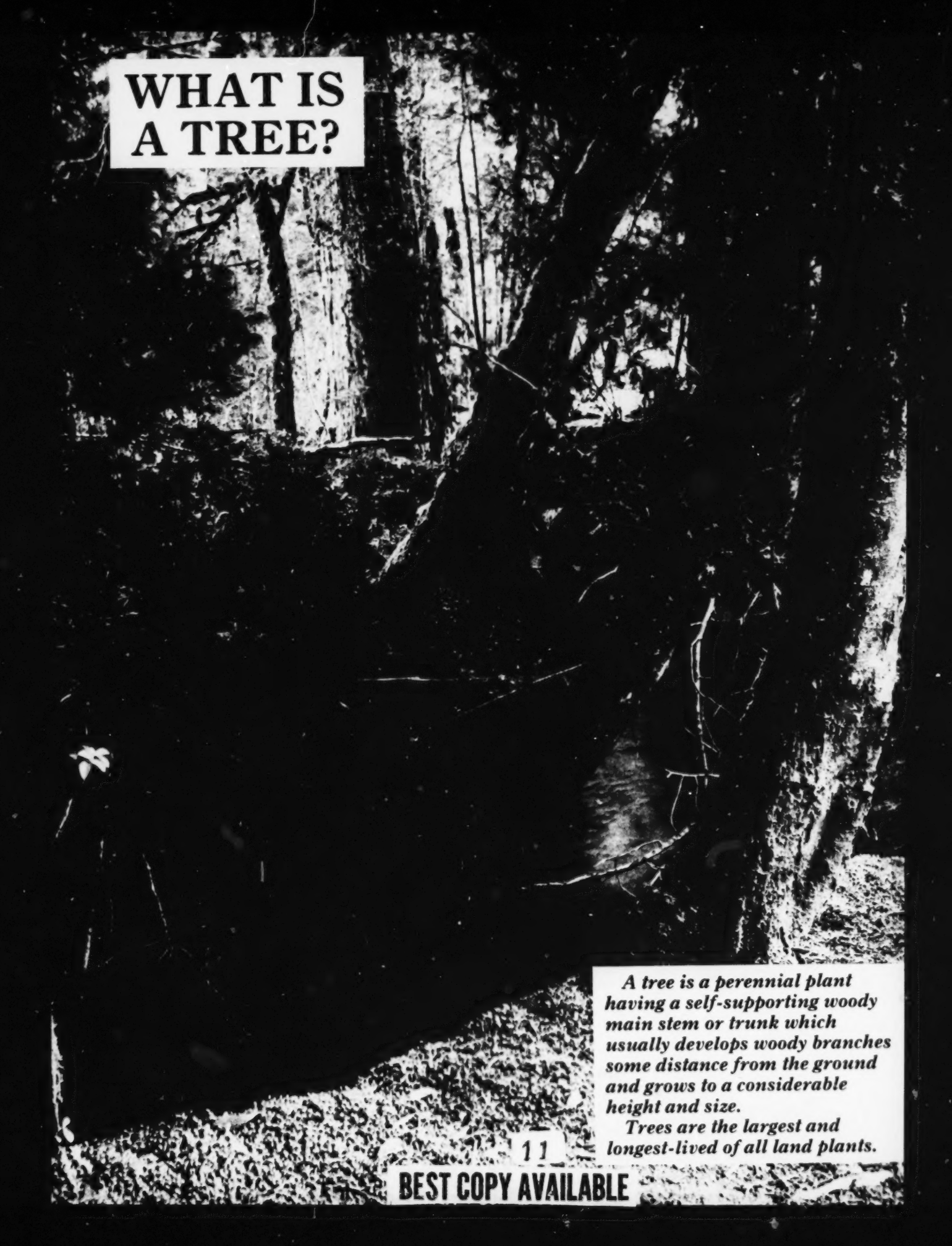
The book should help students to:

- gain awareness, sensitivity and basic understanding of trees and their interactions with the plants and animals in their environment;
- cultivate skills necessary to learn about trees; and
- develop a concern for trees.

The Year of the Tree leads into the Decade of the Tree. We hope this book will initiate increased care and concern for trees, with children taking responsibility for their planting and protection over the next decade and beyond.

Nel Smit

WHAT IS A TREE?



A tree is a perennial plant having a self-supporting woody main stem or trunk which usually develops woody branches some distance from the ground and grows to a considerable height and size.

Trees are the largest and longest-lived of all land plants.

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THE IMPORTANCE OF TREES

AIR

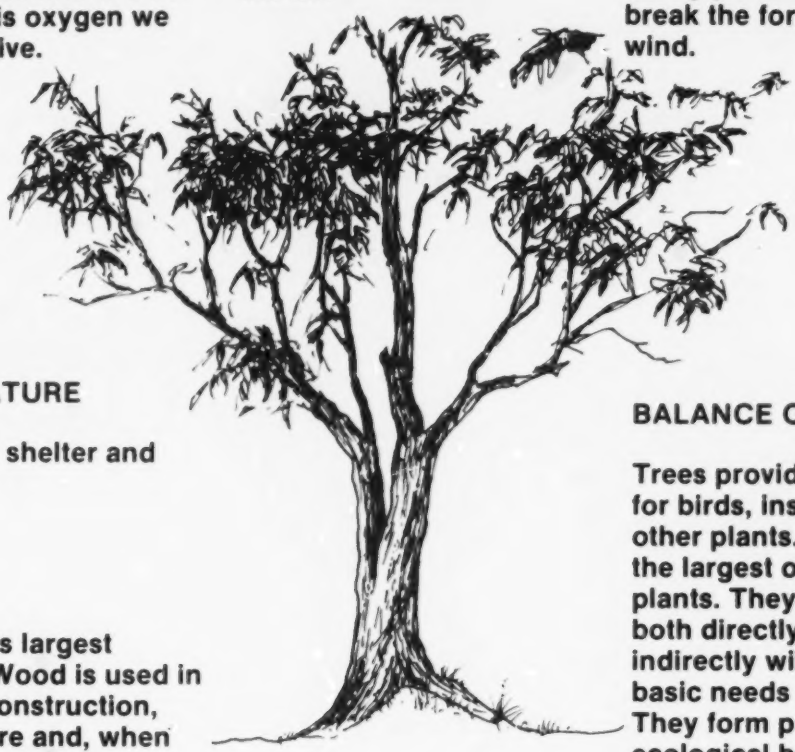
Trees keep the air pure. Green leaves supply life-giving oxygen. They take in carbon dioxide and, using hydrogen from water, make sugars to feed the tree. The oxygen left is released by the leaves into the air. Without this oxygen we could not live.

WATER

Trees are an important part of the water cycle. Trees provide a link between the ground and the atmosphere by bringing water up from the ground and releasing it through the leaves into the air.

EROSION

Tree foliage breaks the force of the rain so that the soil is able to absorb it. Trees bind the soil, protecting it from wind and water erosion. They hold soil in swamps on mountain sides and in sandy places. They also break the force of the wind.



TEMPERATURE

Trees give shelter and shade.

TIMBER

Tasmania's largest industry. Wood is used in building construction, for furniture and, when pulped, for paper.

BALANCE OF NATURE

Trees provide a habitat for birds, insects and other plants. Trees are the largest of all land plants. They provide us both directly and indirectly with all our basic needs for survival. They form part of the ecological balance.

FOOD

Have you eaten the fruit of a tree today?

BEAUTY AND SERENITY

The colours and shapes of a flower, a curving branch, a tree or a forest bring us pleasure. The sound of the wind in the trees is music to some.

Look around you and make a list of all the things you can see which come from trees.

Opposite page. Part of a Huon pine forest in South-West Tasmania.

CARE FOR TREES

When exploring trees, remember —

If collecting, take only a small specimen.

Collect only enough for your study needs. Collecting should be avoided altogether when a species in the area appears to be few in number.

Sketching, photographing and measuring should provide a good record.

Clear plastic containers, binoculars and hand lenses are useful study aids which allow close observation for short periods.

The teacher should:

- visit the area beforehand;
- check access if private property is involved;
- discuss objectives with children and assistants beforehand, but withhold any information which can be discovered directly.

Care is needed when a student party is examining a forest and collecting samples.

Opposite page: Part of a Tasmanian eucalypt forest.

SOME INTERESTING FACTS ABOUT TREES

For every four trees in Australia when Captain Cook landed, there is now only one. Many trees have been felled without being replaced. Australia now has less than five per cent tree cover.

Besides regenerated forests, 150,000 hectares of forest in Tasmania have been converted to other uses in the past eight years.

A particular chestnut tree in Sicily is large enough for 100 people to shelter under it. Thirty people linking hands cannot reach around it.

Trees create half the world's oxygen supply: one hectare of trees provides oxygen for 45 people.

A large elm may have 6 million leaves.

Leaves of a mature apple tree could cover one-fifth of a hectare of ground.

A hectare of 40 growing apple trees collects water from the ground and sends out into the air about 450 tonnes of water in a month.

A tree can contain enough wood to build several six-roomed houses.

More than 250 hectares of wood are needed to produce one issue of a New York Sunday paper.

Thirteen per cent of the paper pulp produced is used for newspaper.

Thirty per cent of the paper pulp produced is used for wrapping.

The Huon pine lives to about 1500 years.

The tallest broad-leafed tree in the world is in the Styx Valley near Maydena, Tasmania. The tree, a swamp gum (*Eucalyptus regnans*), is 98.7m tall.

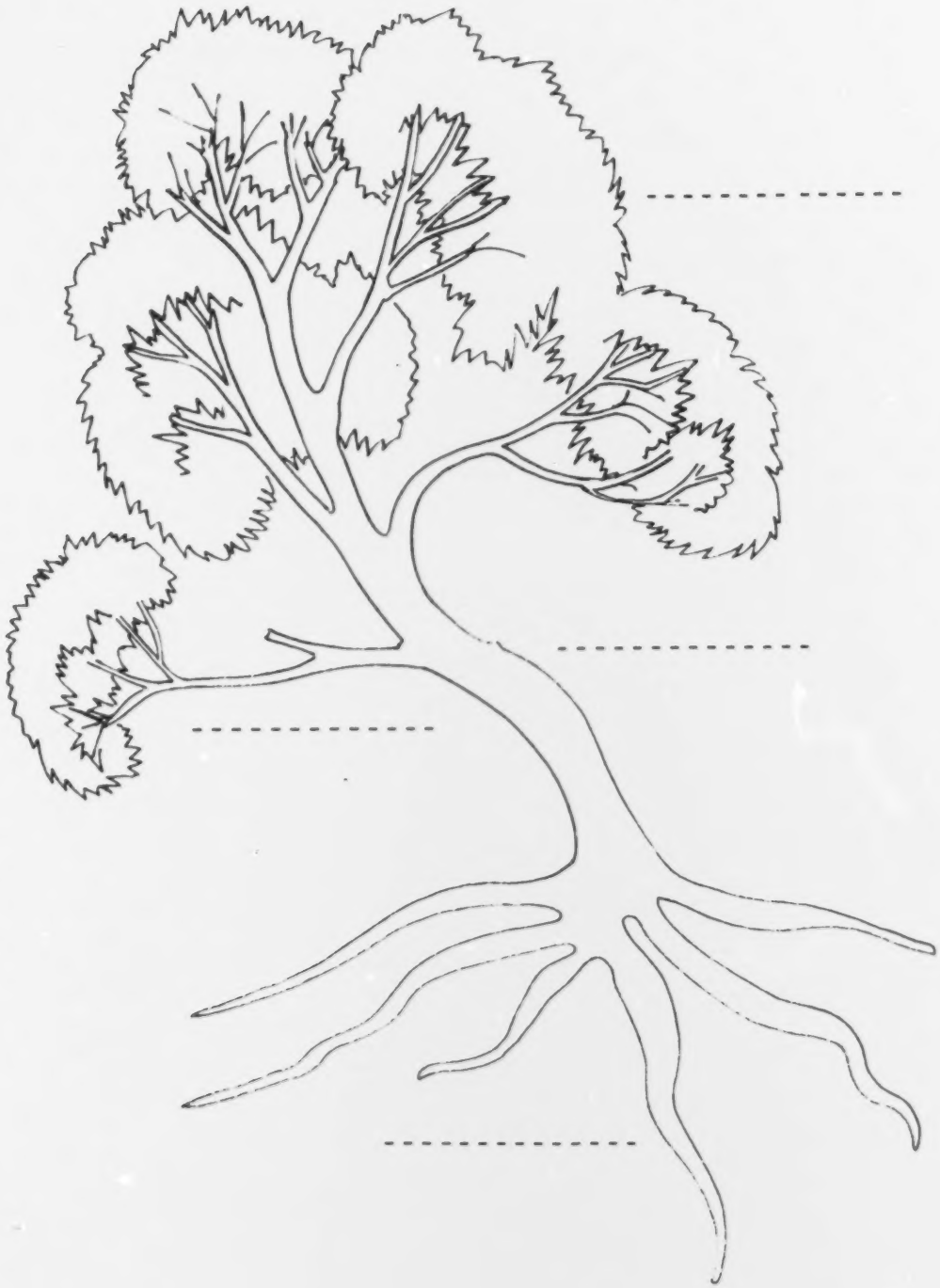
A quarter of Australia's rainforests (456,000 hectares) are found in Tasmania.

In mid-summer a 3m apple tree loses 36 litres of water per day.

Look in your encyclopedia for more interesting facts about trees.

Three stages in a pine tree's growth . . . seedling, sapling and forest.

NAME THE PARTS OF A TREE



PARTS OF TREES AND THEIR SPECIAL FUNCTIONS

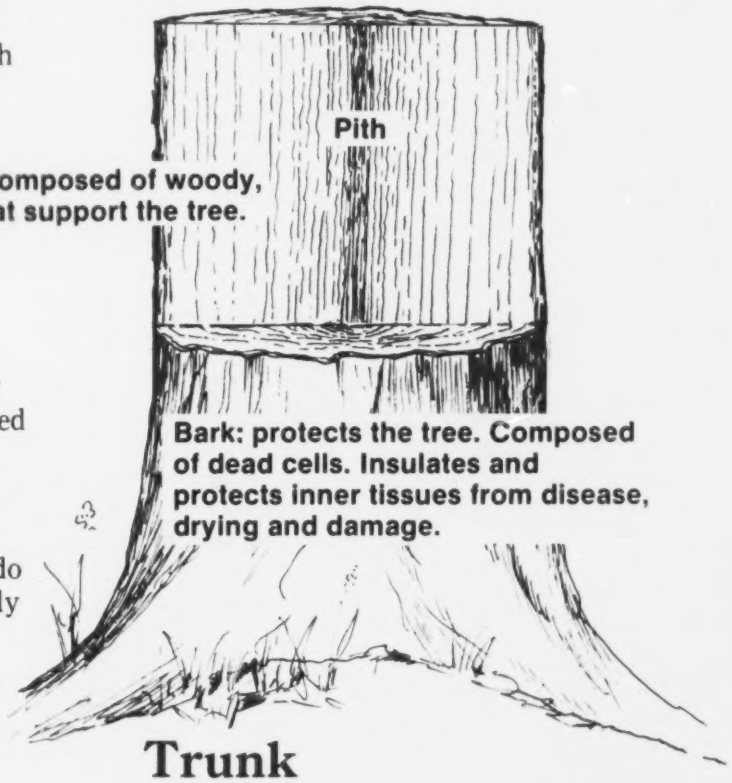
Trees belong to different families, recognised by their flowers, leaves, bark and shape.

Trees grow from seeds. Each seed develops a stem and roots. The stem thickens into a supportive trunk extending into branches from which leaves grow.

The leaves make food for growth and reproduction by flowers and seeds.

Is there a main root with branches or are there several roots growing from the base of the stem?

Examine with a magnifying glass the root tips for root hairs. What differences are there where the plant changes from stem to root?


Pith
Heartwood: composed of woody, dead cells that support the tree.
Bark: protects the tree. Composed of dead cells. Insulates and protects inner tissues from disease, drying and damage.

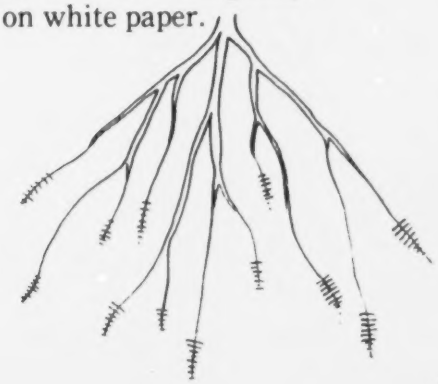
Roots

Roots are the underground branches of the tree. They anchor the tree, gather water and dissolved minerals from the soil and carry them up to the rest of the tree.

Trees with shallow spreading roots blow over more easily than do trees with tap-roots growing deeply into the soil.

Children tend to ignore roots in their consideration of trees.

Look for tree roots on roadside cuttings, on field trips, or obtain a seedling. Shake the soil gently from the roots, rinse the roots gently, observe on white paper.



Trunk

The trunk supports the crown of the tree, holding up the branches and leaves towards the sunlight. It transports water and nutrients from the roots to the leaves and food from the leaves to other branches and the roots.

As the cambium (the growing layer of the tree) grows out, the outer bark stretches and falls off, as in the eucalypts, or it breaks into ridges, as in the casuarinas or pine trees.

Bark

The stems and trunks of trees and shrubs have an outer covering of bark. Sometimes the type of bark on the trunk is different from that on the upper branches.

The function of bark is to protect the trunk from drying up and from:

SHARP TEMPERATURE CHANGES

Small herbaceous plants do not develop woody tissue or bark and during severe cold spells the sap may freeze, killing the plant.

INSECT ATTACK

While many insects may live under the bark of a tree, they usually do not do much damage. It is only when bark is removed, or a limb torn off, that borers, etc., have access to the heartwood.

ANIMALS

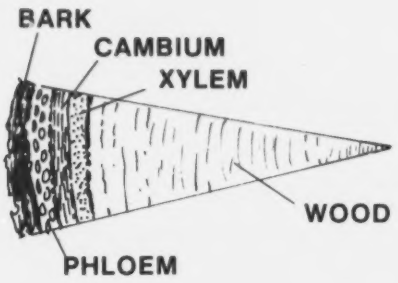
Tree-climbing animals are able to scratch deep enough to damage the tree. Often cattle will rub or chew the bark off stringy bark trees remaining in pasture lands and eventually ringbark them.

BUSHFIRES

The type of bark a tree has determines its vulnerability in a bushfire. In different areas different bark types may survive better than others — for example, some gums have a spongy inner bark and the pale colour helps to reflect the heat of the fire. The stringy bark may burn easily, but the thickness of the bark still helps to insulate the trunk.

Bark is formed on the inner surface, and the older layers on the outside split and fall off.

The inner layers of developing bark contain phloem tubes which carry food from the leaves to the roots.



Completely removing all the bark —ring-barking — will kill the tree.

Look for these eucalyptus bark types:

- smooth and peeling off in flakes or ribbons;
- thick, long and fibrous;
- rigid and short-fibred;
- rough and scaly.

Just as the cover helps us to recognise a book, the bark can help us to recognise a tree.

USES OF BARK

Aborigines used various barks for a variety of purposes:

- fibres were spun into threads;
- stems and leaves were chewed and then the fibres spun into threads;
- slabs were used as shields;
- pictures were painted on inner surfaces;
- canoes were made from several species by cutting a long section, heating it in ashes until it became pliable, bending it to shape and sealing the ends with clay;
- pimelea bark was used in making bags, nets and bands to fasten things together.

Early settlers used bark of some trees — for example, stringy bark —to roof houses and sheds.

Bark from small, shrubby pimeleas ('rice flowers' or 'bushman's bootlace') is extra strong and was used for tying up parcels and for bootlaces.

Bark from several species of acacia was used for tanning animal hides. Bark from some species of melaleuca was used for caulking boats. Many barks contain dye-stuffs, in varying shades of brown, but have not been used extensively.

SOME ACTIVITY IDEAS

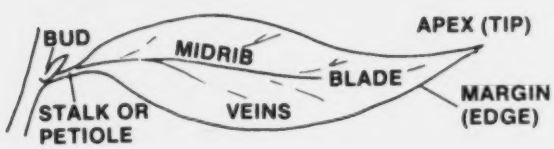
- Look carefully at the bark on one of the trees in your surroundings.
- Describe the colour and texture of the bark.
- Make a rubbing and compare different trees.
- How many different trees can you find by looking at their bark?
- Be sure to note the colour and texture of the bark.
- Keep these rubbings in a folder.
- Lift the bark carefully and look for animal homes. Do not dislodge large sections of bark. Remember that the bark is the tree's protective covering, or skin.

Leaves

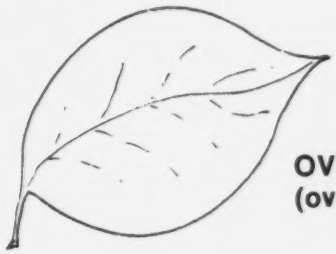
Leaves are the food factory of the plant. They use light from the sun to make sugar for the plant so that it can grow.

The food is made from water from the soil and carbon dioxide from the air.

The leaves give off oxygen and excess water into the atmosphere. Leaves adapt to suit their natural environment. In dry areas there are

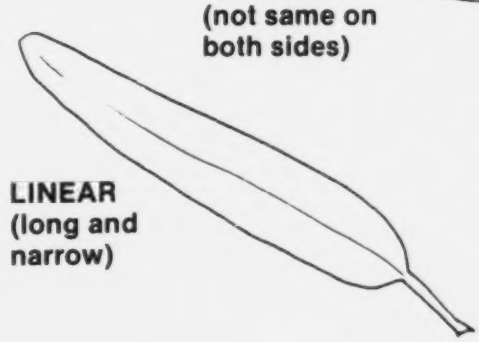


Leaves have a large range of shapes and sizes. Look for different leaf shapes.

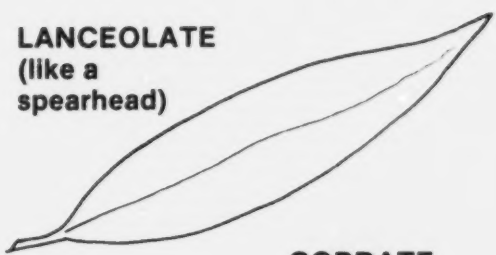


OVATE (oval)

OBLIQUE (not same on both sides)



LINEAR (long and narrow)



LANCEOLATE (like a spearhead)

CORDATE (heart-shaped)

many plants with leaves which are slender and spiny, reducing water loss by evaporation (transpiration). Some leaves turn an edge towards the sun.

Most Australian plants are evergreen, which means they do not lose all their leaves during winter. Old leaves are dropped and then replaced all year round.

Look at leaves on trees. Where are they? How do they hang? How are the leaves arranged on the branches? Are they:

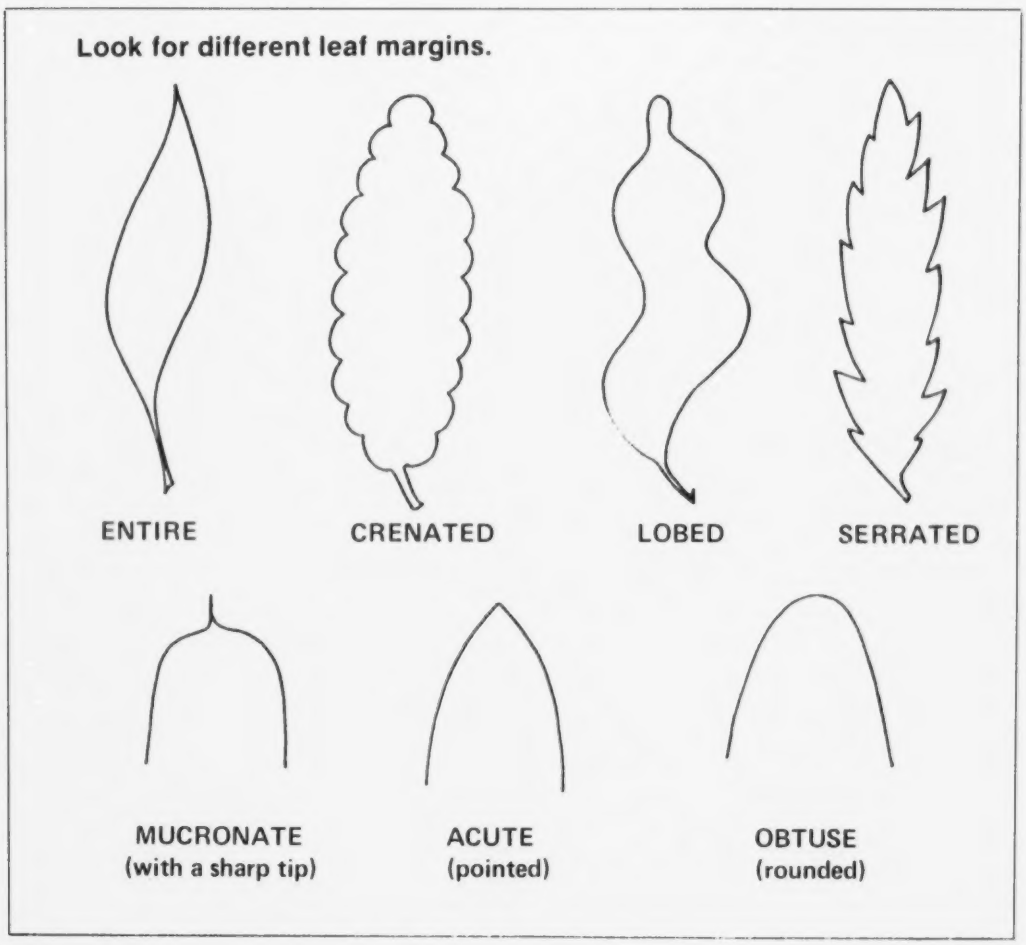
- opposite?
- alternate?
- in bundles?
- in circles?
- compound or simple?

Leaves have a large range of shapes and sizes. Look for different leaf shapes.

Flowers

Some trees produce flowers so that pollen can be transferred from the flower to the stigma of another flower of the same kind. This then forms the fruit and seeds.

The pollen is transferred by wind, movement of water, humans, insects, birds and small mammals.



Some trees do not have flowers. The seeds of gymnosperms (such as pines and cypresses) form from separate male and female cones. Pollen from the male cones is carried by the wind to the female cones.

Eucalypt flowers do not have petals.

Look for these flower shapes — eucalypt, wattle, tea tree, banksia.

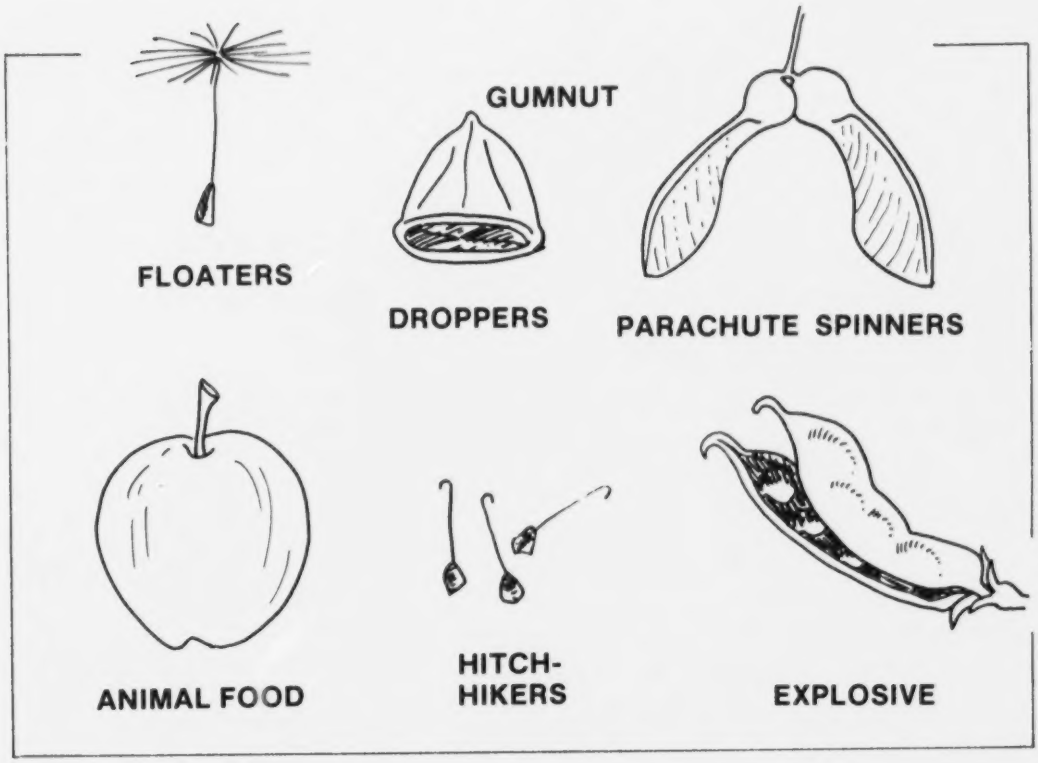
Seeds

After fertilisation, seeds begin to grow and the ovaries develop into capsules, pods, cones, berries or nuts which enclose and protect the seeds. All these containers are known as fruits. Seeds differ in shape, size and quantity. Some grow inside succulent fruits and the seeds are scattered by birds and animals which eat the fruit — for example, apricots, coprosma.

Nuts are eaten directly. Some are protected by woody capsules, such as those in gumnuts and tea trees. These can protect the seeds on the trees for a long time, sometimes for years.

Pods protect seeds — for example, as in wattles. The pods split open when dry, releasing the seeds. These seeds have a very hard coating, so that the seeds will germinate only if the hard coating is burnt by fire. The hard coating helps the seeds to retain for a long time their ability to germinate.

Collect as many seeds as you can. Find out how the seeds are dispersed.

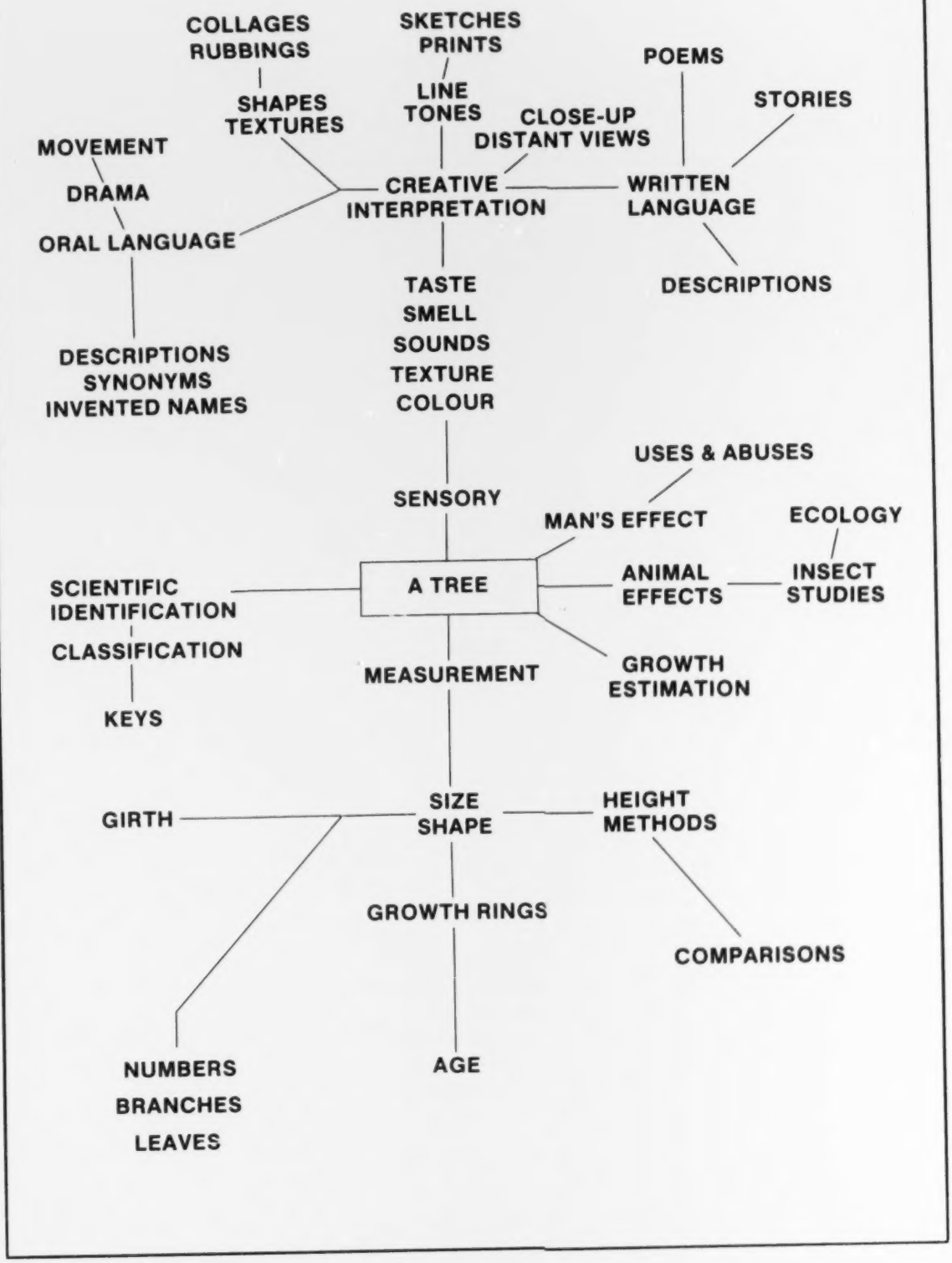


ACTIVITIES

An essential part of tree studies is working outdoors. Go anywhere trees grow, in the school grounds, in the local environment, the Botanical Gardens, local parks, forestry reserves, national parks, nurseries and field study centres.

This section suggests a wide range of activities suitable for children of different ages. Teachers can form a variety of programs by putting together ideas from different categories.

CHART OF ACTIVITY IDEAS



Use your senses

Smell the odours of a rotting log and a handful of soil; crush a gum leaf.

Listen to a tree. On a windy day put your ear on the trunk of a smooth-barked tree.

How many sounds can you make with parts of a tree?

Touch a trunk, hug it; feel the edge of a leaf. List all the different textures you can feel on one tree. Find a tree by feeling it.

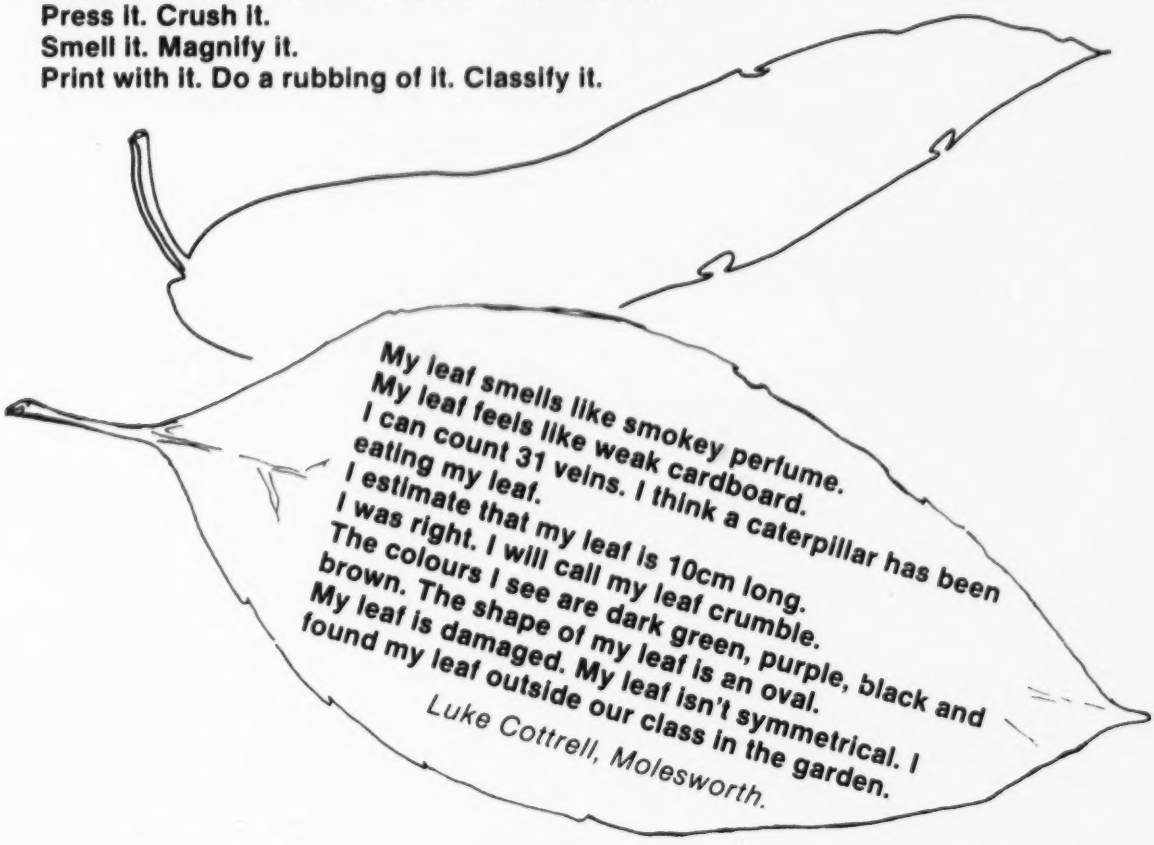
Blindfold your partners, spin them around. Lead them carefully to a tree. Let them get to know it. Lead them back to the start. Spin them again. Take off the blindfold. Where is the tree?

Look:

- at colours — dark, bright, hazy, light, camouflage, blending, contrasting. Use paint colour charts to match colours with parts of the tree. Try grading colours. Find things around the tree which match the colours of the tree;
- for shapes — round, long, thin, cylindrical, crescent, star;
- for lines — wavy, cracked, uneven, wobbly;
- for patterns of any kind.

FIND OUT ABOUT A LEAF

Look at it. Feel it. Name it. Grow it. Measure it.
Press it. Crush it.
Smell it. Magnify it.
Print with it. Do a rubbing of it. Classify it.


My leaf smells like smokey perfume.
My leaf feels like weak cardboard.
I can count 31 veins. I think a caterpillar has been eating my leaf.
I estimate that my leaf is 10cm long.
I will call my leaf crumble.
I was right. The colours I see are dark green, purple, black and brown. The shape of my leaf is an oval.
My leaf is damaged. My leaf isn't symmetrical. I found my leaf outside our class in the garden.
Luke Cottrell, Molesworth.

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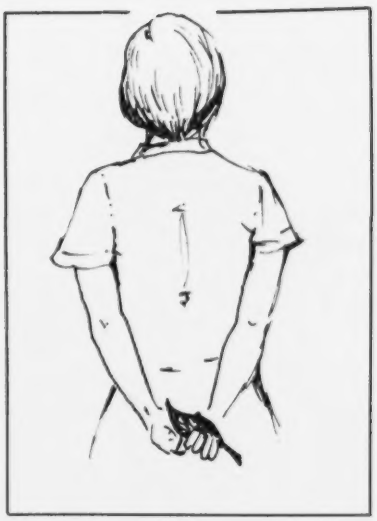
FIND YOUR LEAF



You will need an area with leaf litter on the ground.

With a partner, choose a leaf and feel it carefully. Swap your leaf with your partner.

Choose other leaves which are similar to your partner's leaf.

Take it in turns to put your hands behind your back and feel the different leaves, and identify yours.

Is this your leaf? No, it's too crumbly and wide, etc.

FEELING BAG

To make a 'feeling bag' you will need a large supermarket paper bag and a piece of cardboard to fit the open end of the bag.

Cut in the cardboard a hole large enough for the hands to reach through. Tape the cardboard to the edge of the open end of the bag.

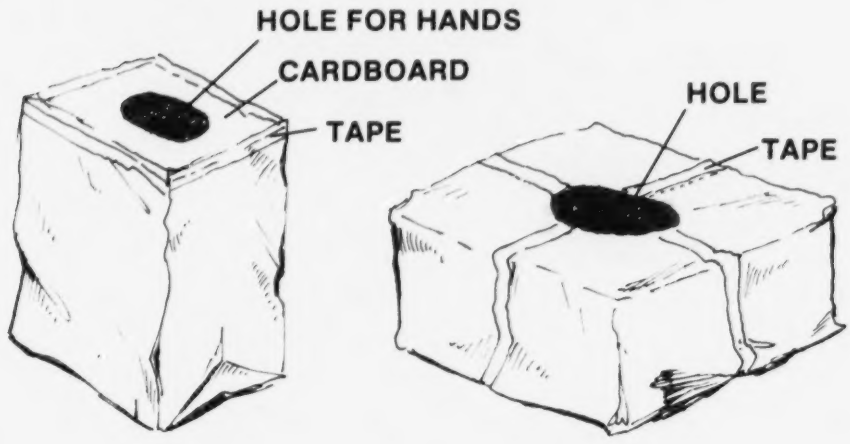
A carton can be used. Tape the carton and cut a hole in the lid.

Place in the bag or box a number of different parts of a tree. Identify them by feeling.

Add some things not belonging to a tree. Identify the odd thing out.

Take the bag into a bush area. Make a collection of leaves beforehand.

With the group, make a matching 'feeling bag'.



MATCHING ATTRIBUTES

Find an area of leaf litter. Select an interesting part of a tree. (Don't damage any trees — pick something up from the ground.)

Describe your object to a partner. Swap objects.

Find another object, which is not the same but matches your partner's object in some way — perhaps it has the same

texture
colour
pattern
shape
length
size
mass
age

'NED KELLY'

You will need blindfolds — for example, big supermarket paper bags — and trees.

In groups of three, choose a tree and find out as much as you can about it. Use one of the activity sheets to help you to investigate it.

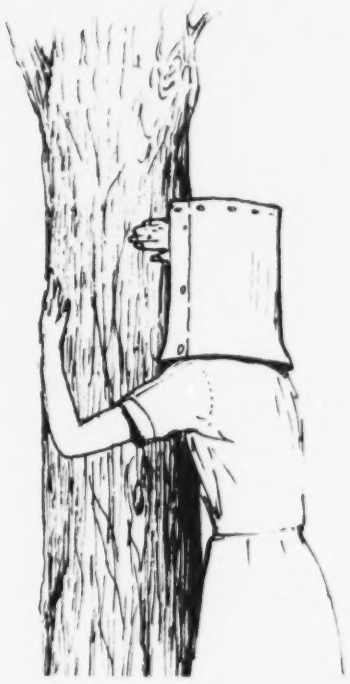
When you think you know your tree, take it in turns to lead one of the group, blindfolded, to a number of different trees and see if you can identify your tree by feeling it.

Note: Your blindfolded partner relies on you to be led carefully from tree to tree. Don't walk quickly, and make sure you tell your partner about any obstacles on the ground.

Alternatively:

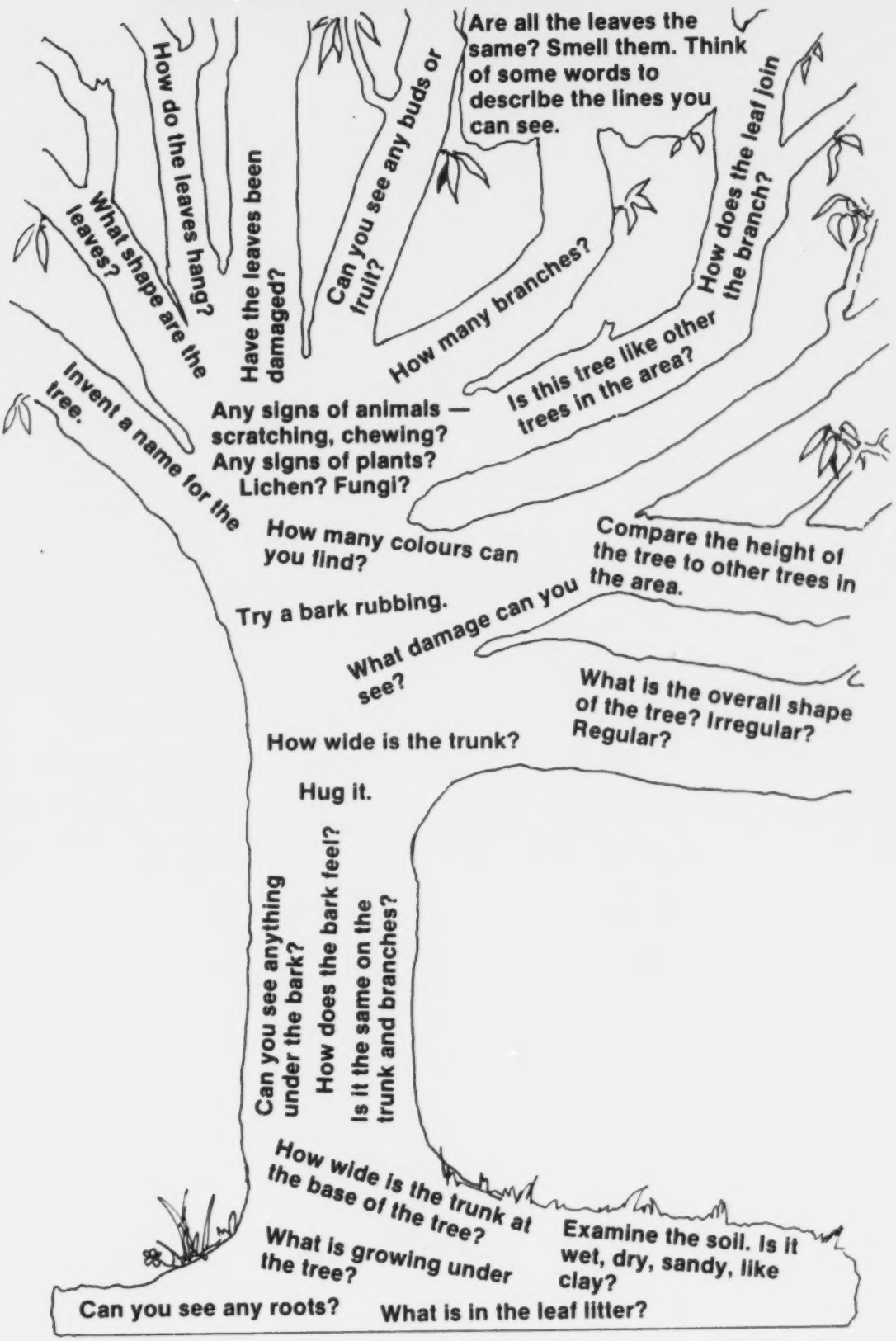
Blindfold one person in your group of three.

Spin the blindfolded person around. Take him or her to a tree to get to know it by feeling. Take him or her back to the starting spot. Take the blindfold off. Can the person see his or her tree?



Tasmania's tallest tree, a swamp gum 98.7m high near Maydena.

GO AND EXPLORE A TREE


Are all the leaves the same? Smell them. Think of some words to describe the lines you can see.
How do the leaves hang?
What shape are the leaves?
Have the leaves been damaged?
Can you see any buds or fruit?
How many branches?
How does the leaf join the branch?
Is this tree like other trees in the area?
Any signs of animals — scratching, chewing? Any signs of plants? Lichen? Fungi?
Invent a name for the tree.
How many colours can you find?
Compare the height of the tree to other trees in the area.
Try a bark rubbing.
What damage can you see?
What is the overall shape of the tree? Irregular? Regular?
How wide is the trunk?
Hug it.
Can you see anything under the bark?
How does the bark feel?
Is it the same on the trunk and branches?
How wide is the trunk at the base of the tree?
Examine the soil. Is it wet, dry, sandy, like clay?
What is growing under the tree?
Can you see any roots?
What is in the leaf litter?

27

Language ideas

TREE WORDS

Words to do with trees

trunk, foliage, stick

roots, stump, resin

branches, wood, cone, twig

bark, pith, nut, evergreen

leaves, growth rings, deciduous

root hairs, crown

limb, cambium, stump, sawdust

fork, canopy, gum, cardboard

bough, timber, felling

twig, forest, paper

silviculture, didgeridoo

paper, violin

charcoal, pegboard

shingles

Can you think of more?

Tree products — apples, paper, rubber, coconuts, walnuts, cherries, apricots, cork, peaches, oranges, timber (furniture, houses).

Tree sayings — out on a limb (in a dangerous or exposed position)

barking up the wrong tree (to make a mistake)

at the top of the tree (in the highest position)

up a gum tree (on the wrong track).

Double meanings (homonyms)

leaves, branch, pine

bark, fork

trunk, gum

crown, stick

wood

THOUGHTS

Imagine you are one of the following:

- an artist
- an ecologist
- a landscape architect
- a forester
- a bird living in a tree
- a caterpillar
- a camper
- a child.

Describe what a tree would mean to you.

Describe a tree in:a gentle breeze; a storm, with lightning and thunder; a drought; a fire; or a tree being planted, climbed, carved upon, nested in, cut down.

FIND TREE TREASURES

On your tree find something:

young
eaten

growing well

dried

dead

damaged, injured

old

rotten

growing on

unusual, special

scary

rough

hard

smooth

stringy

springy

prickly

soft

leathery

brittle

sharp

sticky.

ENVIRONMENTAL DRAMA

Choose an accessible bushland or parkland area, preferably close to school. Present the problem. The council is debating whether to sell this important area of bushland. If it sells the land, then it also must decide to whom it will sell.

The children develop roles as:

- a recreation officer
- wood yard manager
- golf course manager
- home owner
- local child
- naturalist, or conservation group representative.

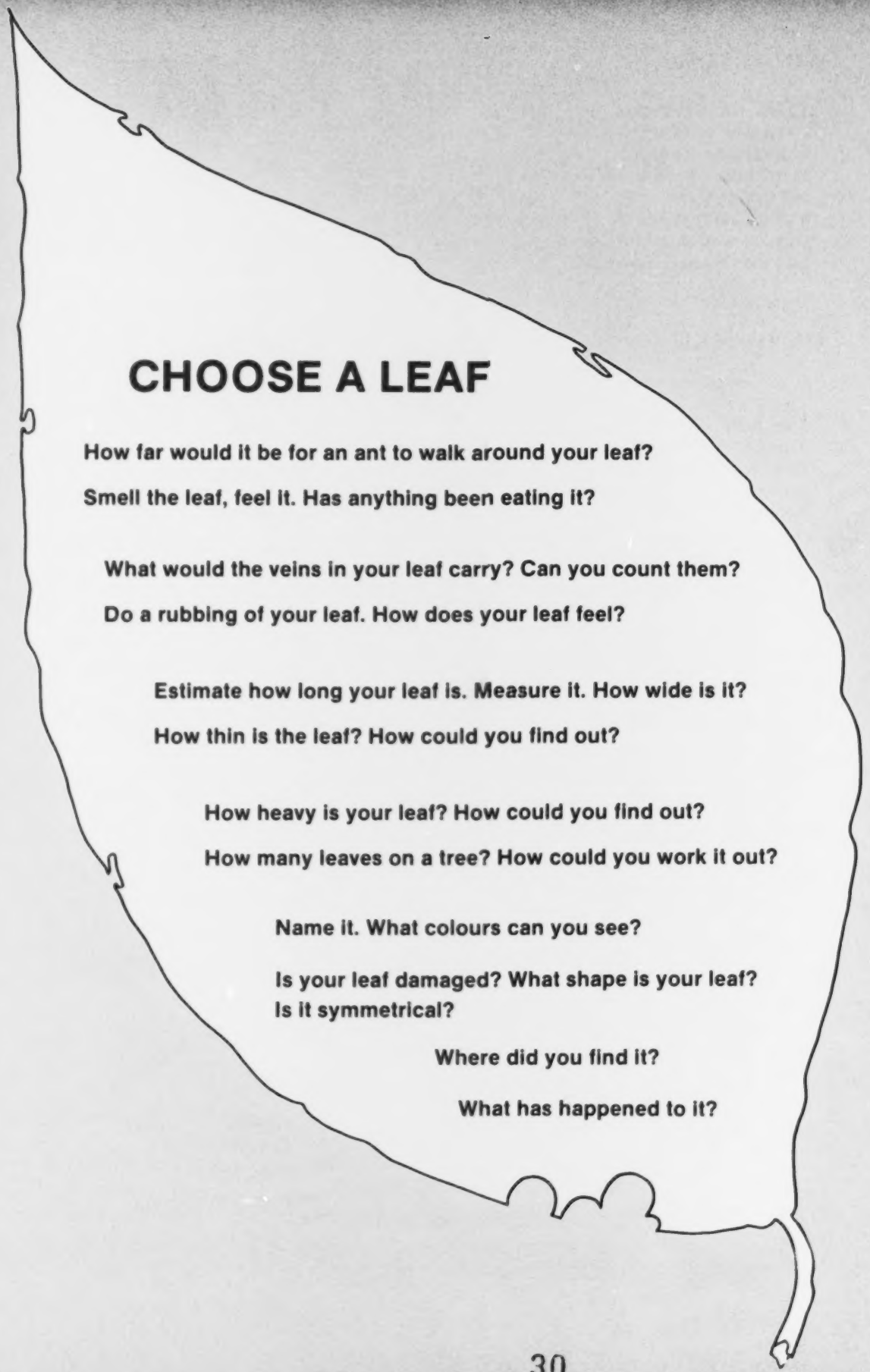
Children research and prepare their roles. Choose two different points of view for debate.

Think about

- social, economic, ecological, aesthetic advantage
- the good of the community
- long-term effects

in relation to the whole area.

Tasmanian black gum, one of the eucalypt family.



CHOOSE A LEAF

How far would it be for an ant to walk around your leaf?

Smell the leaf, feel it. Has anything been eating it?

What would the veins in your leaf carry? Can you count them?

Do a rubbing of your leaf. How does your leaf feel?

Estimate how long your leaf is. Measure it. How wide is it?

How thin is the leaf? How could you find out?

How heavy is your leaf? How could you find out?

How many leaves on a tree? How could you work it out?

Name it. What colours can you see?

Is your leaf damaged? What shape is your leaf? Is it symmetrical?

Where did you find it?

What has happened to it?

WINDY TREE

Think of the muscles
a tall tree grows
in its leg, in its foot,
in its wide-spread toes –
not to tip over
and fall on its nose
when a wild wind hustles
and tussles and blows.

Dorothy Aldis

THE SECRET PLACE

Halfway up a certain tree
There's a place belongs to me,
Two branches make a little chair
And I like it sitting there.
I like it.
And it's secret too.
No grown-up guesses where I go.
And if he should, and climbed to it –
He would not fit, he would not fit!!

Aileen Fisher

TREES

Mysterious
Towering skyscrapers
Dry
Knotted and shady
Swaying branches
Drooping slender fingers
Of brown, yellow and gold.

Simon R., Bowen Road Primary School

TREES

Leaves so soft
Crunchy
Falling so softly to the
ground
Welcoming you to come
'Climb the tree'.

Danielle Wise

TREES

Trees,
big shady
knotted trunk, curly bark,
rough leafy
Trees.

Danielle Wise

Draw the basic shape of different trees.

Describe your tree in order that a friend can find it.

Synonyms: Describing colours, textures, smells.

SHAPE POEM

Draw the shape that the tree makes. Write some words describing the tree over your drawing.

towering
swaying whispering
branching
stretching
sheltering
all
year
it
stands
in light
and dark
heat and cold

Bev Allison

TREES

Spreading branches
Curling bark
A home for a witch
Knotted
Tangle trunk.

Danielle Wise

TREES

Tall,
Stripping bark,
Scattered branches,
Leaves green, white, brown,
and silver.

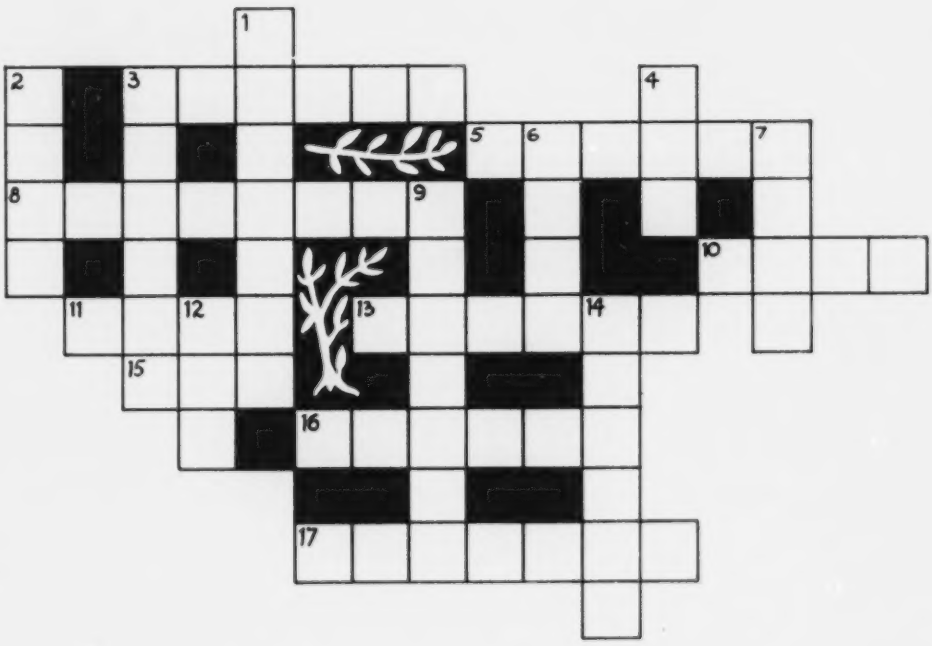
Simon R., Bowen Road Primary School

Make a list of 20 or more words that come into your mind while exploring a tree.

Put the words on cards and spread them out. Ask children to select words they like. Arrange them into a word ladder. Read it as a group. Rearrange the words if necessary.

Tasmanian eucalypt forest with rainforest underneath.

Crossword



ACROSS

3. The food factory of a tree
5. Limb, bough
8. Type of Australian tree
10. What trees are made of
11. Wooden clothes holders
13. Australia's national tree, with yellow flowers
15. Fruit with tough shell
16. A large area of trees
17. Trees provide ___ for animals

DOWN

1. The _____ tree in Australia is a eucalypt growing near Maydena in South-West Tasmania
2. The largest land plant
3. Plants which grow on trees or rocks
4. An insect which lives and feeds on trees
6. Underground branch
7. Type of pine tree found only in Tasmania
9. Small shrub or native tree which grows in wet areas
12. Common name for a eucalypt
14. Many leaves fallen on the ground

TREE MATHS

What is the overall shape of the tree?
Which trees grow wider?
Which trees in the area grow taller?
Which trees have more leaves?
Which trees have the largest leaves?
What shape are the leaves?
Are the leaves symmetrical?
Which way do they point?
Look for buds — how many in a cluster?
How many seeds in a pod?
How many leaves?
Count one section and then estimate how many sections.
Estimate the average length of the leaves. Measure 10 leaves. Divide by 10.
Estimate and measure the perimeter of a leaf.
To measure the diameter of the trunk — hold two sticks parallel on opposite sides of the tree. Measure the distance between the two with a third stick.
Measure the circumference at three levels
• at ground level
• one metre up
• as high as you can reach

MEASURING THE HEIGHT OF A TREE

Stand back and look at the tree. Estimate its height in metres. Record the estimates.

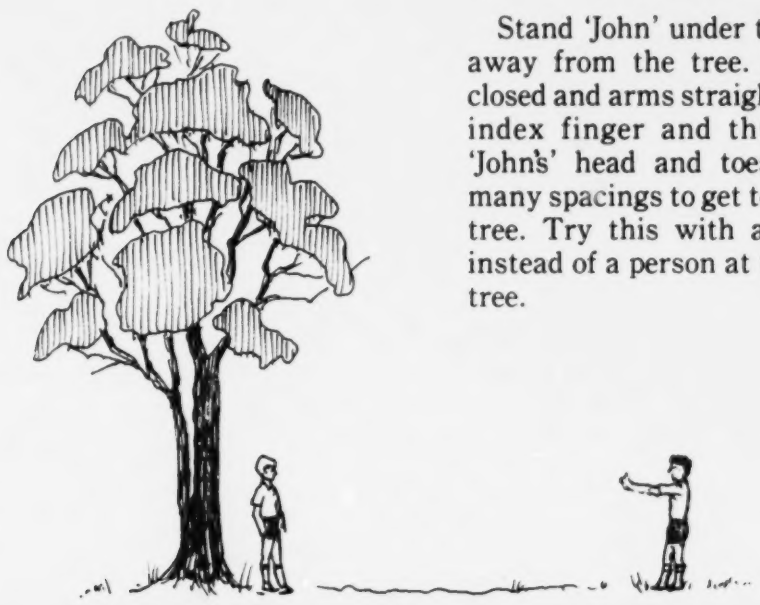
Shadow method

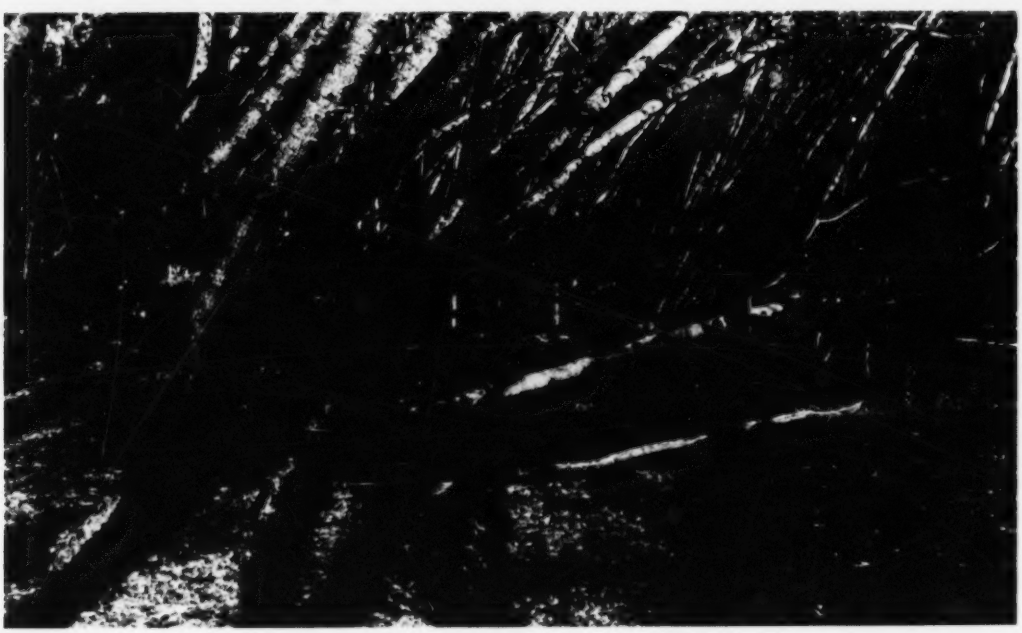
Hold a metre stick perpendicular to the ground. Measure the length of its shadow. Then measure the length of the tree's shadow.

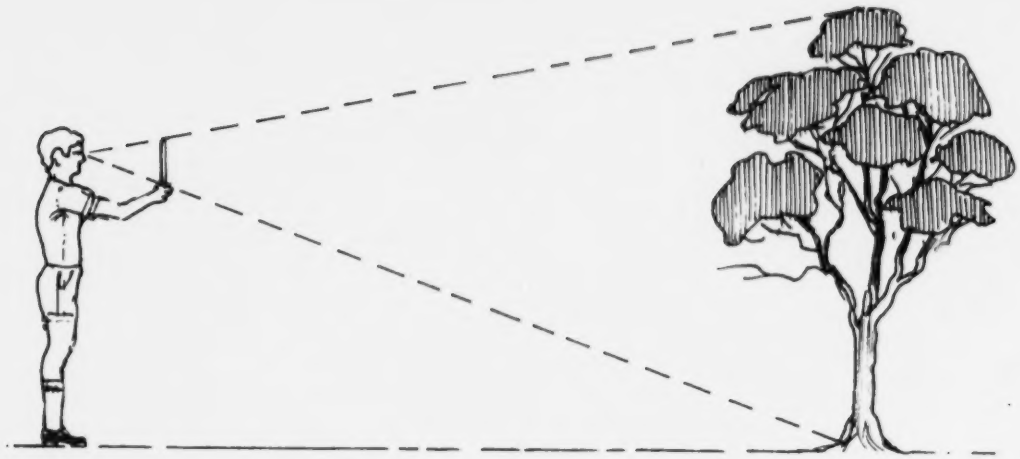
$$\text{Tree's height} = \frac{\text{Metre stick height} \times \text{tree's shadow length}}{\text{Metre stick shadow length}}$$

How many 'Johns' tall is the tree?

Stand 'John' under the tree. Stand away from the tree. With one eye closed and arms straight, spread your index finger and thumb between 'John's' head and toes. Count how many spacings to get to the top of the tree. Try this with a metre string instead of a person at the base of the tree.

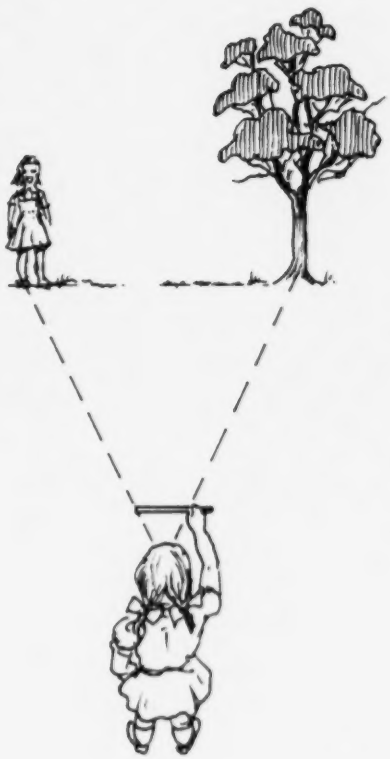






Felled-tree method

Stand so you can see the top of the tree. Hold a straight stick vertical towards the tree. Close one eye. Sight across the top of the stick in line with the top of the tree. Place your thumb on the stick, in line with the base of the tree. Hold the stick steady. Turn the top of the stick horizontally until it lines up with the ground. Note where the stick lines up with the ground and measure from that point to the base of the tree.



ESTIMATING THE NUMBER OF LEAVES ON A TREE

Choose an average-sized branch and count the number of leaves on it. Then count the number of branches. Then multiply the number of leaves by the number of branches.

TARZAN'S TRAVEL

Requirements: closely wooded area, stopwatch or watch with a second hand.

The aim of the game is to stretch from tree to tree, touching as many trees as possible, in a set time.

You must always be touching one tree at all times. Once you let go to stretch to another tree, you are out of the game.

You must not count the same tree twice, though you may touch the same tree twice. You must count aloud.

How many trees can you touch in 10 seconds, 15 seconds, 30 seconds?

Try again. Can you improve your score?

Try different areas. What can you discover about tree density?

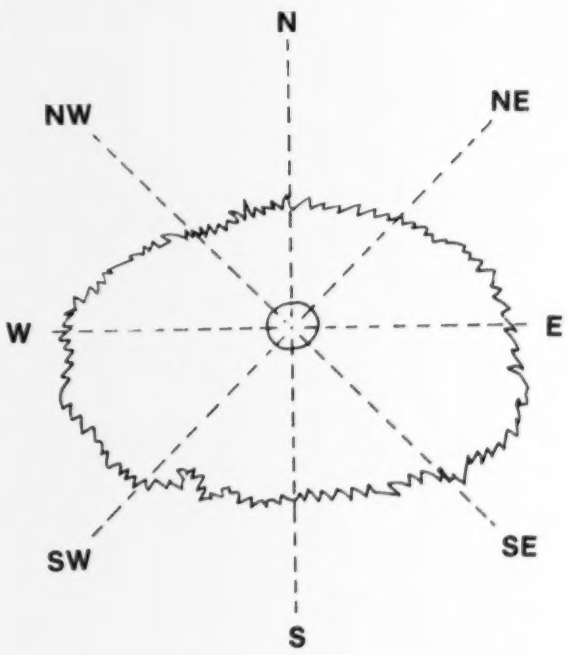
MEASURING THE SPREAD OF A TREE'S BRANCHES

Measure the diameter of the tree and calculate the radius (half the diameter).

Using a compass, find north. Measure and record the distance from the trunk of the tree to the furthest spread of the branches. Add the radius.

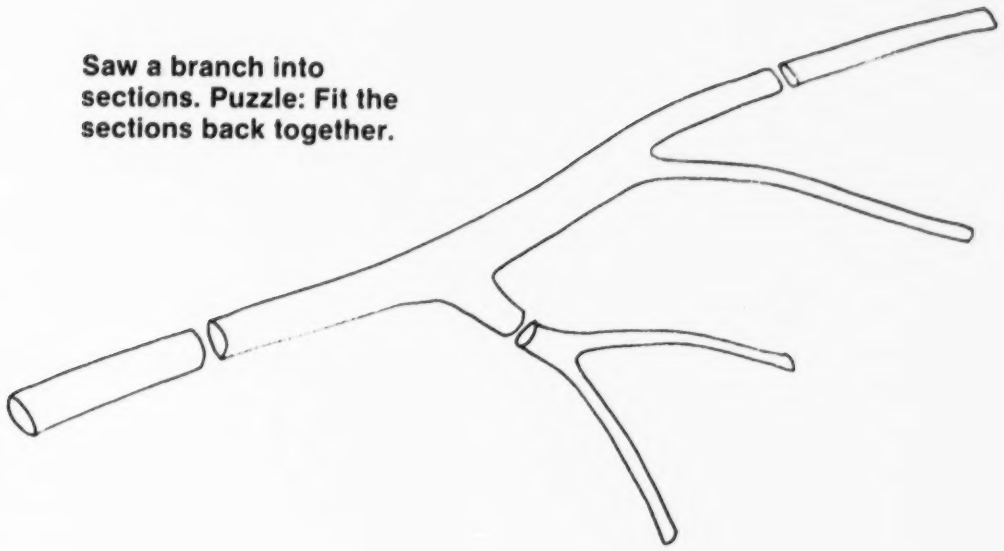
Map the spread by using a scale drawing — for example, 1cm = 1 metre. Record other compass points and join the points to complete the diagram.

Find out which trees have the biggest and smallest spread. Do branches grow to the same length in all directions? If not, why not? Consider the effect of winds, slope, other trees, light and water.



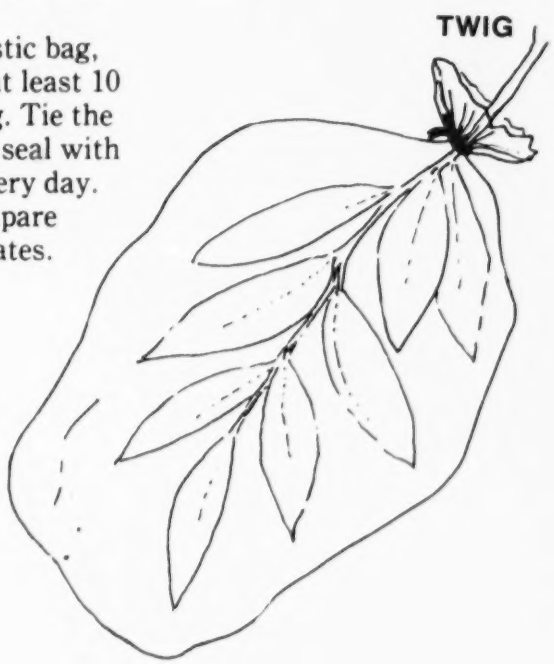
MAKE A BRANCH PUZZLE

Saw a branch into sections. Puzzle: Fit the sections back together.



MEASURING LEAF WATER LOSS

You will need a large plastic bag, string, electrical tape. Put at least 10 leaves inside the plastic bag. Tie the bag tightly to a branch and seal with tape. Measure the water every day. Try different trees and compare water loss (transpiration) rates.



Art and craft

As a preliminary to these activities, explore different perspectives of trees and associated objects in terms of line, colour, texture and shapes. The perspective may be a close-up, a distant view or a 'worm's eye view' of patterns within leaves, patterns of a collection of leaves (for example, high in a tree or on the ground), line patterns from a distance, the overall shape of a tree, shapes of sections (as made by branches) and bark patterns on a tree trunk (rubbings).

RUBBINGS

A leaf rubbing is made by placing a piece of thin paper over the leaf and then evenly rubbing with crayon or a soft pencil.

CLAY IMPRINTS

Press the underside of a leaf into a small ball of clay. Try pressing clay on to different surfaces — try gumnuts, casuarina seeds, bark. Be careful not to press the ball too flat.

PRINTING

Ink or paint the undersides of several types of leaves. Then place the leaves carefully on the paper to be printed. Cover with scrap paper and rub or roll the surface.

BUSH CREATIONS

Frame a small area of ground with four sticks and create patterns and designs from the surrounding bush litter. The possibilities range from two-dimensional representational arrangements to three-dimensional structures.

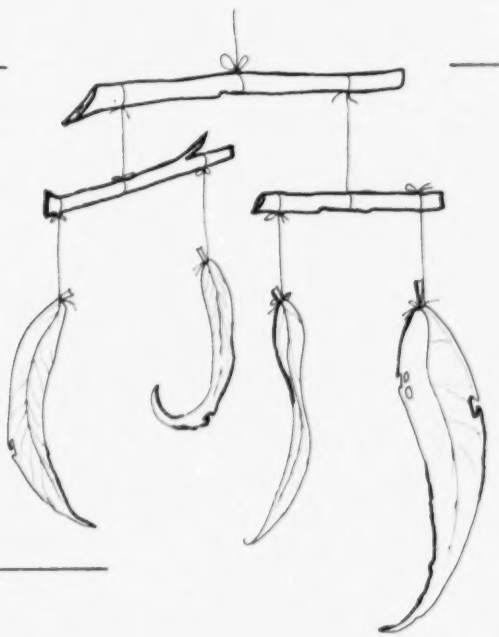
DRAWING WITH CHARCOAL

Draw a tree from memory, perhaps a familiar one in the playground, then draw by observation. Compare sketches. Exhibit pairs of drawings to rest of class.

WAX-PAPER PRESSING

You will need leaves, wax-paper, iron, towel. Place a leaf between two layers of wax-paper. Cover with a towel and press with a warm iron. The leaf could then be cut around the margin.

MAKE A MOBILE



NATURAL DYEING

Australian trees provide a ready source of material for dyeing. Best results come from the leaves, but bark and flowers also can be tried.

If using an open fire, you will need tin cans or old saucepans. You also will need raw wool (washed); an old stocking; one tablespoon per 100g wool of salt, or vinegar, or alum (potassium aluminium sulphate, available at chemists).

Many natural dyes will fade unless the yarn is first treated with a mordant — that is, a chemical to help to fix the colour in the fibres. Alum, salt or vinegar can be used as mordants, simmered gently with the wool for an hour. Cool and stand overnight.

Place leaves in saucepan or tin and cover with cold water. Pound the leaves. Place raw wool in the stocking and place in the container. The ratio of leaves to wool should not be less than 2 to 1 — that is, half the quantity of wool to leaves. Bring to the boil. Colouring will begin to be noticeable after about 20 minutes.

Alternatively, boil leaves for an hour first. Remove leaves from water. Cool. Then add wool and boil for 20 minutes. This will be more successful (but takes longer).

Another method is solar dyeing. After mordanting the wool, place it in a glass jar and sit it on a sunny window-sill for several months.

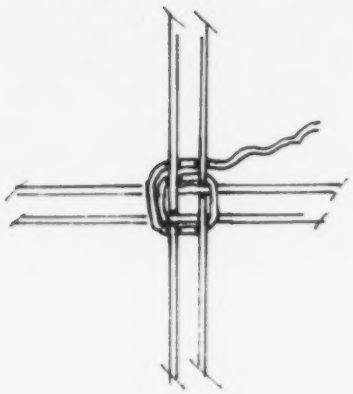
Note: Remember to take care in collecting. The materials should be collected from trees with many leaves, or bark collected from the ground. There should be no noticeable damage to the area.

POT POURRI

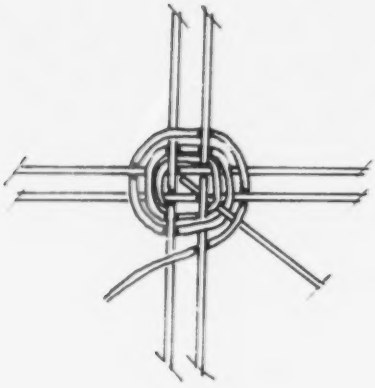
Collect a selection of fragrant leaves, flowers. Spread them out on trays to dry on a sunny shelf. When dry, place in a container with powdered orris root. (This helps to fix and preserve the smell. Orris comes from the ground root of iris germanica and can be bought at health food shops.) Mix a quarter-cup of orris root to six cups dried material. Cover with a lid and stand for two to three weeks, stirring gently every few days. Place in small jars and containers covered with light fabric or sew into small fabric bags.

WILLOW BASKET WEAVING

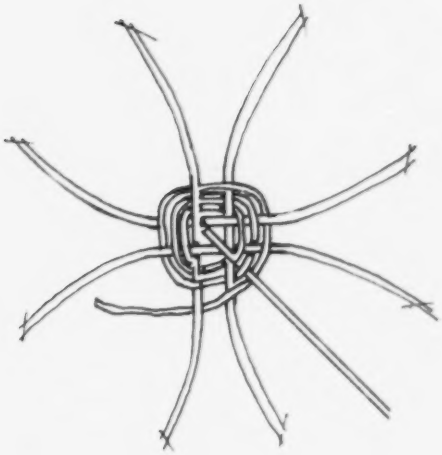
Collect long, thin, whippy willow branches. Use green growth. Soak them for 24 hours.



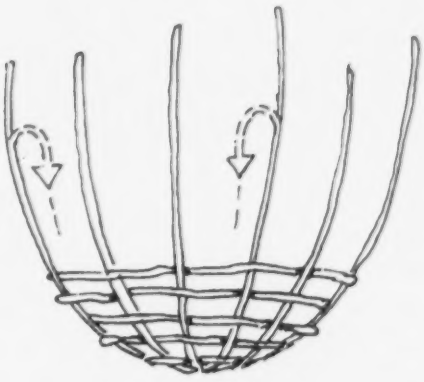
Make a cross with four willow branches. Start weaving: over two, under two, with a fine branch, pulling it in firmly.



Add an extra half piece or branch to make an uneven number then continue over one under one.



Start spreading the branches to make the spaces more even.



Bend the upright branches over and tuck down securely.

HAND-MADE PAPER

What you will need

Any type of soft, tissue-type paper or scrap paper without any gum

Paint stirrer (electric drill attachment) or whisk attachment on electric hand beater

Wooden frame with heavy-gauge wire (the most manageable size would be about 200mm x 200mm)
Bucket
Flower press or similar
Chux super wipes.

What to do

Tear paper into very small pieces. Put in bucket and cover with water. Leave standing for at least a week, or until all paper breaks easily when touched.

Beat with electric attachment until mixture is a pulp.

Fill up large laundry sink with water.

Empty pulp mixture into this water.

Using a sweeping action, dip frame into trough at about a 45° angle; aim to get an even cover of mixture over wire mesh.

Concentrate on quick wrist action after immersing frame into water when bringing it out. Shake lightly until most of the moisture has drained off.

Have flower press prepared with layer of Chux. Turn layer of pulp mixture on to Chux, cover layer with another Chux.

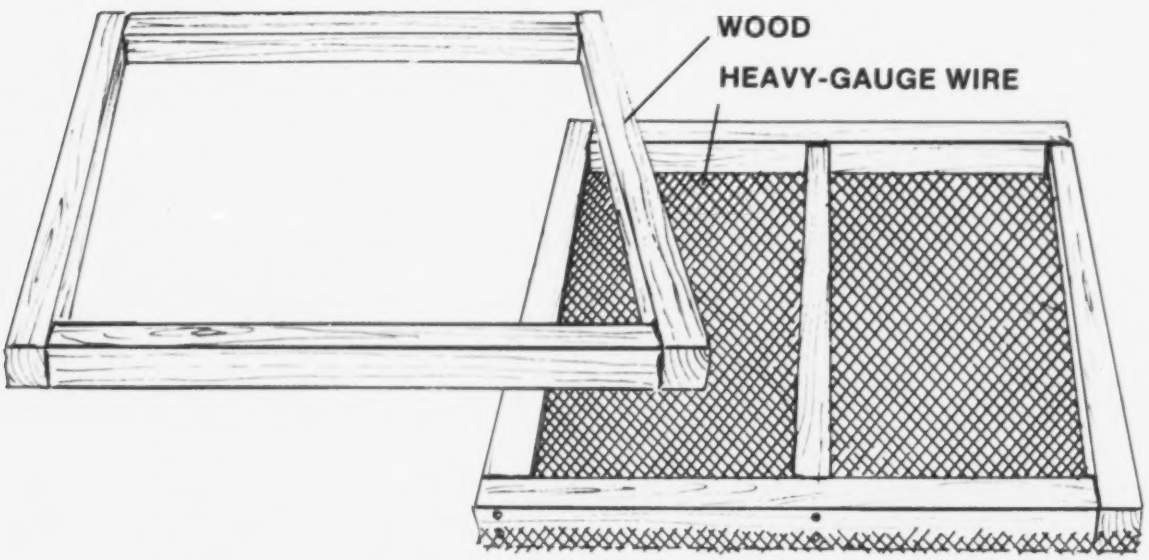
Repeat process until all mixture is used.

Leave the paper in the press for a couple of days.

Remove carefully and dry on a flat surface.

This is one way of saving paper. Think of other ways you, your class, your family and the community can save on paper — for example, writing on both sides of the page, recycling envelopes, taking a shopping basket to save on shopping bags, mulching the garden with newspaper.

THE DECKLE



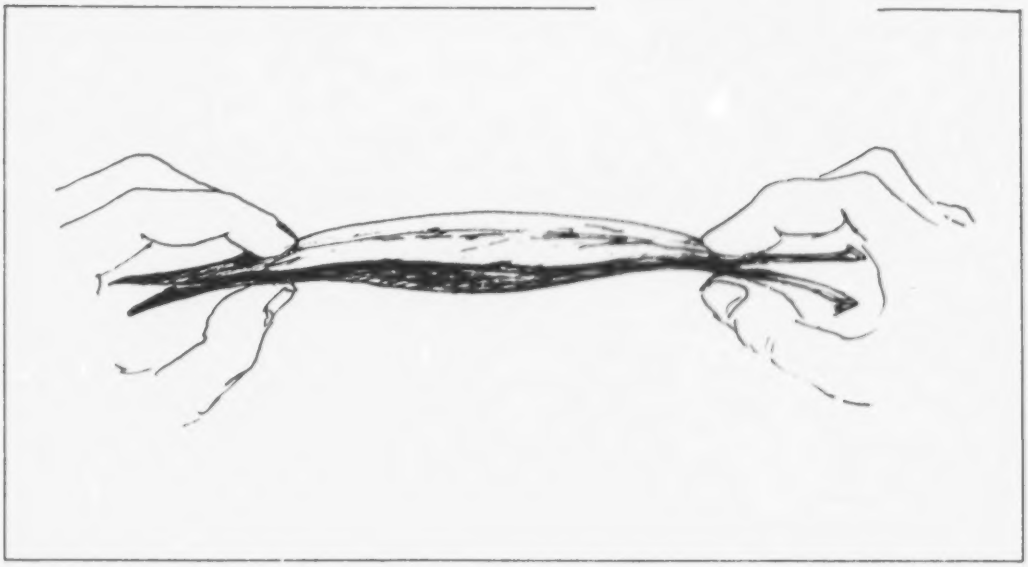
Music and sounds

On a windy day, listen to the trunk of a smooth-barked tree.

In the bush, collect some parts of a tree with which you can make a sound. Experiment with different sounds, combine them together, make sound patterns with some friends.

Do different types of wood make different sounds? Experiment with things around you. Look at and listen to wooden musical instruments such as a flute, violin, guitar, didgeridoo.

Make a gumleaf whistle. Hold two soft, narrow leaves together at both ends. Put your lips on the edge of the leaf and blow gently. You should make a buzzing sound.



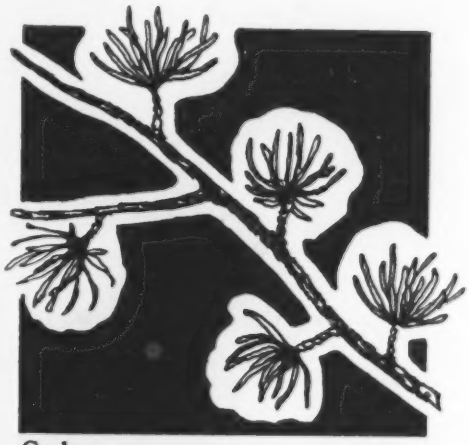
Science

SOME TASMANIAN TREES

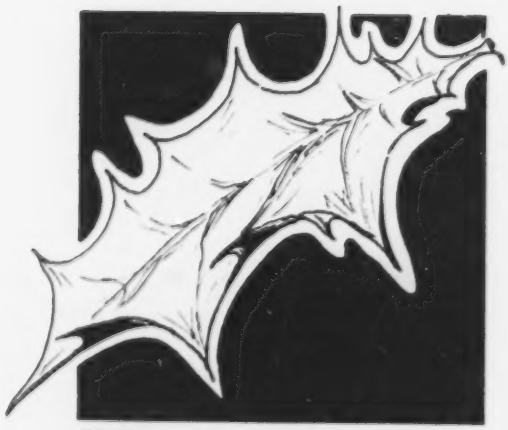
Banksia
Musk
Tea tree
Bedfordia
Myrtle
Beyeria
Blackwood
Celery top pine
Deciduous beech
Dogwood
Hakea
Horizontal
Huon pine
King Billy pine
Bottlebrush
Waratah
Native cherry
Native laurel
Native plum
Oyster Bay pine
Paper bark
Pencil pine
Pittosporum
Prickly box
Prickly mimosa
She oak
Lancewood

COMMON INTRODUCED TREES IN TASMANIA

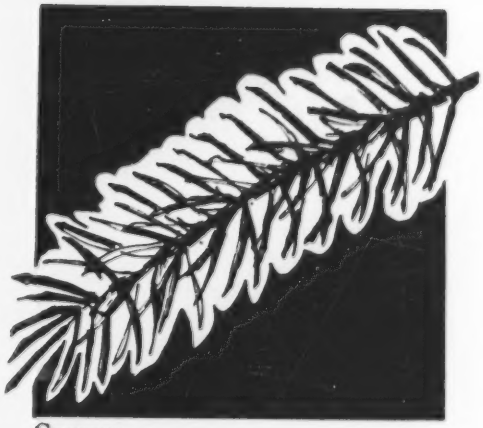
Evergreen



Cedar



Holly



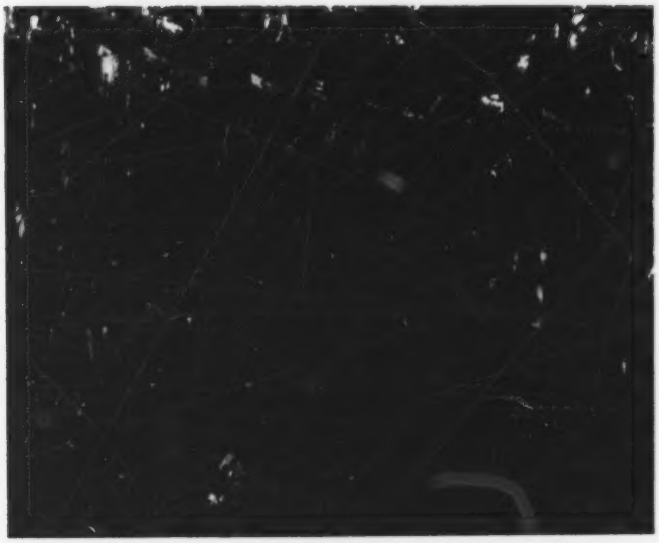
Spruce

Also radiata pine, fir

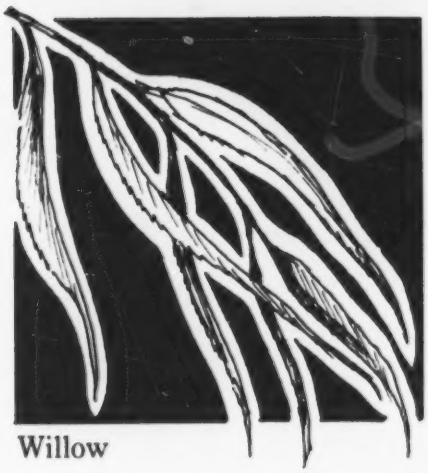
41

Deciduous

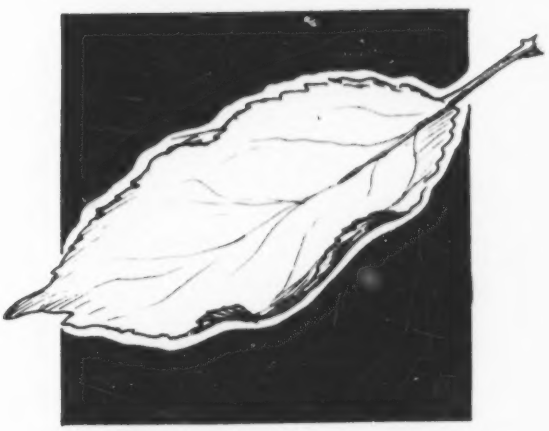
Elm
Maple
Poplar
Beech
Cherry
Peach



Hawthorn



Willow



Apple

Walnut

IDENTIFICATION

Pressing plants not only dries and preserves them, but also provides a basis for plant identification and for other activities.

The plant material should be dry and should be pressed soon after picking. Collect it in a plastic bag.

Note: Use sharp secateurs to collect specimens, to avoid damaging the plant.

Insert plant material between sheets of newspaper. This absorbs the moisture.

Use sheets of corrugated cardboard to separate the layers of plants. This helps to absorb some of the uneven shapes of the branches and flowers.

The plants may need four weeks to dry.

Specimens for a collection should be mounted on card and labelled with the name of the plant, where it was collected, conditions (for example, rocky outcrop, gully), size of plant, special features, date collected and name of collector.

For best results the collection should be laminated and stored in a ring-binder. This can provide an excellent reference to local specimens around your school. Pressed leaves also can be used for making cards.

Here are some questions to ask when identifying a tree:

Where is it found? What type of soil does it grow in? Is it in a wet or dry spot, sunny or shady? Are there other plants like it around? What size are they? How does the size compare with other plants around?

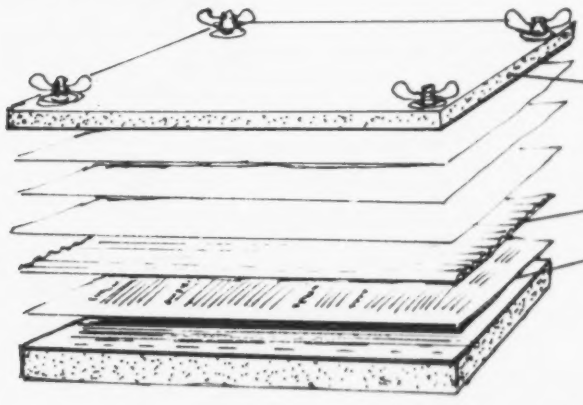
Describe the trunk, bark, stems, leaves, flowers, buds or fruits.

Take a photograph of a tree. Draw it. You may be able to take a small sample from the tree for collection, if this is permitted in the area of study.

Invent a name for your tree.

Press and mount your sample from the tree on stiff card with the available information written on it. The more details you have recorded, the easier it will be to identify. Use your library for identification of specimens or send them to the Molesworth Environment Centre, Molesworth 7451.

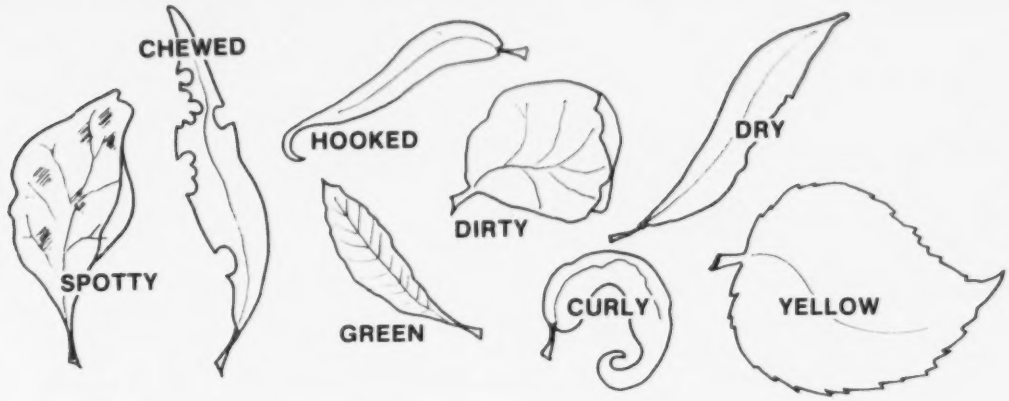
PLANT PRESS



Dimensions — not much bigger than 30cm square — but the size depends on the thickness of the board.

Alternatively, use an old telephone book as your press.

LEAVES COLLECTED AND NAMED BY CHILDREN



CLASSIFICATION

Sorting things out needs clear descriptions. If you can describe things clearly, you can make a key to help others to identify leaves.

A key is a means of grouping and categorising differences in a collection of objects — in this case, leaves.

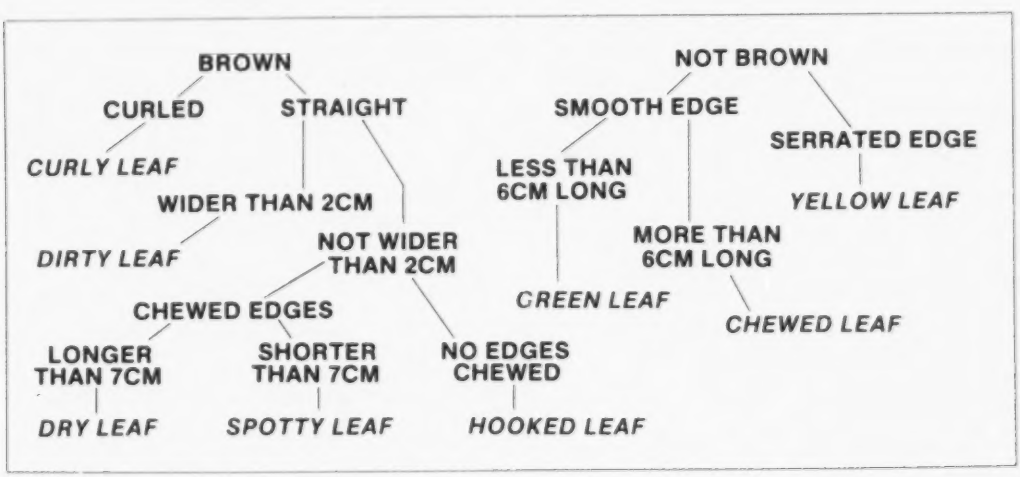
Each child should choose a leaf and describe its special characteristics. Invent a descriptive name for the leaf.

Put all the leaves together and list the descriptive words, so the children can compare the similarities and differences among them.

Separate the collection into two piles according to a **single** distinguishing characteristic. Then divide each of the two smaller piles according to another single characteristic.

Continue to separate each group into two smaller ones, each time basing the divisions on separate distinguishing characteristics until each group contains only one leaf.

Make a key of the classification system.



Using the same collection of leaves, make another key, beginning with different characteristics. The diagram could be converted into a numbered scientific format, for example:

1. Brown	go to	2
or not brown	go to	6
2. Curled		*curly leaf*
or not curled		3
3. Fatter than 2cm		*dirty leaf*
or not fatter than 2cm		4
4. Smooth edges		*hooked leaf*
or chewed edges		5
5. Longer than 7cm		*dry leaf*
or not longer than 7cm		*spotty leaf*
6. Smooth edges		7
or serrated edges		*yellow leaf*
7. Less than 6cm long		*green leaf*
or more than 6cm long		*chewed leaf*

To find the name of one of the leaves, begin with No. 1 — Is it brown or not brown?

Follow the direction of the key until you are not directed to any other point. The name of the leaf is the final stopping point.

Note that common names should be introduced only on completion of the key. The key will be specific to this group of leaves.

It may be a useful extension for children to make a key to leaves of trees in the playground. This key could then be used by other groups to identify trees in the playground.

The grouping divisions should be absolute — that is, not 'thin' or 'fat' but 'more than 5cm wide and less than 5cm wide'.

Celery top pine in a Tasmanian forest.

TREES AS HOMES

Look carefully at the trunk, limbs, branches and twigs. Make a note of the things you find growing there.

Look for lichens. Use different-coloured mapping pins to mark out

different colours of lichens growing on trees. Feel the lichens. Invent names for the different types.

Where do you find most of the lichens growing? Lichens are often more prolific on the south side of a tree, as the tree is most moist on this side, away from the sun. Do lichens grow only on some trees?

Think of a reason for your discoveries.

Logs provide a home for various invertebrates such as insects, worms, spiders, scorpions, millipedes and centipedes.

Look for invertebrates on the leaves or under the bark. Look for chewed leaves, skeleton leaves in the leaf litter, leaf galls where insects have laid eggs under the skin of the leaf.

Open the gall to look for the eggs or larvae inside. If the gall is brown and has a hole in it, then the insect will have left its home.

Leaf shake

You will need a large sheet of white paper, or a light-coloured towel or sheet.

Choose a low branch. Examine it for possible invertebrate life.

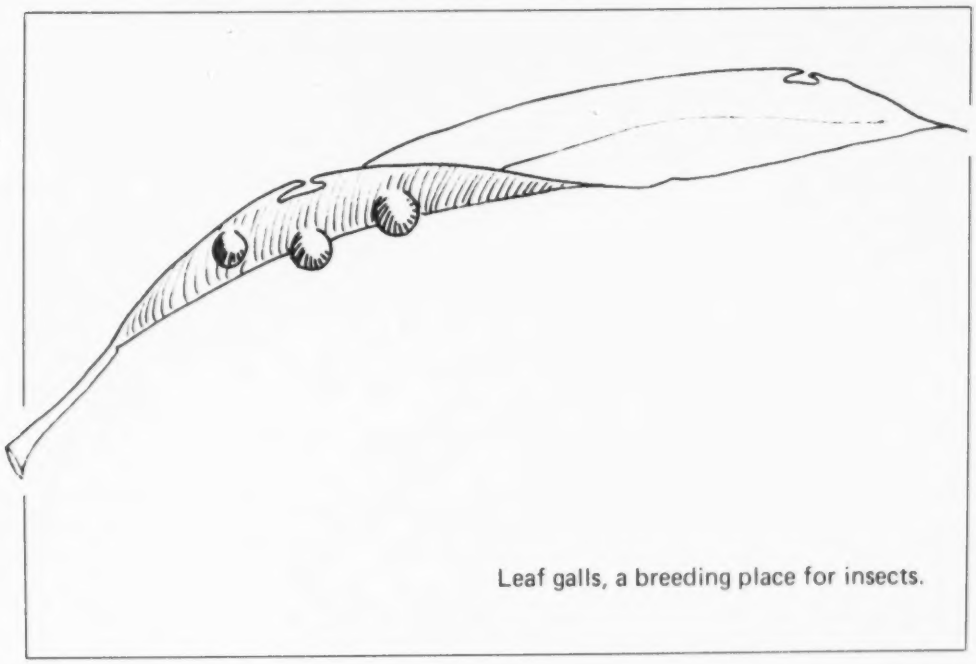
Hold the sheet under the branch and shake the branch vigorously. Look carefully for flying insects before they depart.

Examine other specimens on the sheet with a hand lens.

Record findings and compare with different trees of the same species and with trees of different species.

Are some small creatures specific to particular trees at different times of the year, different times of the day, or in different weather?

Try to discover why the animal was using the tree and if the animals are helping or harming the trees.



Leaf galls, a breeding place for insects.

STUMPS AND LOGS

How are they different from a living tree? Can you find evidence to discover what has happened to them?

The development of a community on a stump is similar to the development of other plant communities.

The lichen pioneers grow with light and moisture. They trap dust, and with dead lichen produce some soil for larger plants.

Mosses need a small amount of soil. As the moss grows, the bottom leaves of the plant die off and add to the soil layer.

Insects and fungi helping to break down the wood produce more soil, assisting ferns and larger plants to get established.

Nutrients from the log or stump are returned to the soil to be used again by living plants.

Look for different stages of decomposition. The inside of the stump will decompose before the outside, which was the growing layer of the tree. The heart wood on the inside was formerly dead cells, used by the tree to store waste products.

Examine the cross-section of a tree trunk (preferably a tree that has been cut recently). Look at the growth rings.

In the spring, when there is plenty of water, the tree produces large cells which are light in colour. In summer the cells become thinner and darker.

Towards the end of the summer the tree stops making new cells. The cells make layers called annual growth rings.

Points to ponder

What would a sudden increase in the size of the growth ring mean?

What would a black scar on a growth ring mean?

How thick is the bark?

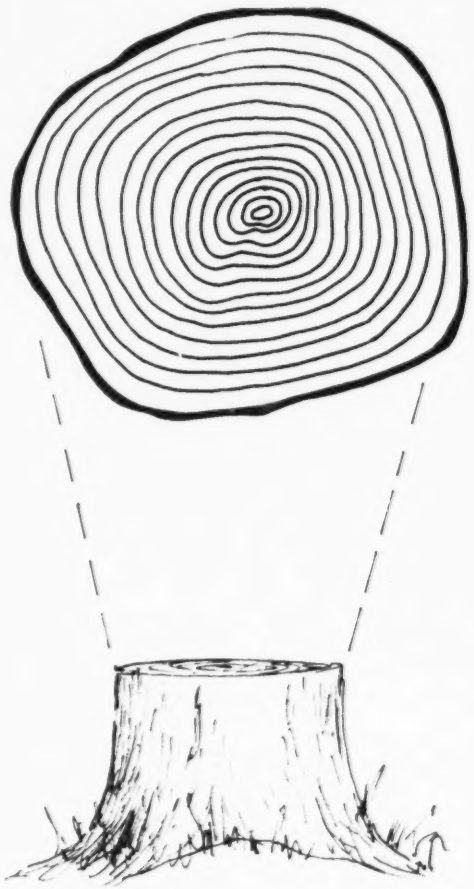
How old was the tree when it was cut?

Match dates with growth rings on the tree.

Which layer is the thickest?

How would drought or frost affect the growth of the rings?

How old was the tree when you were born? When the school was built?

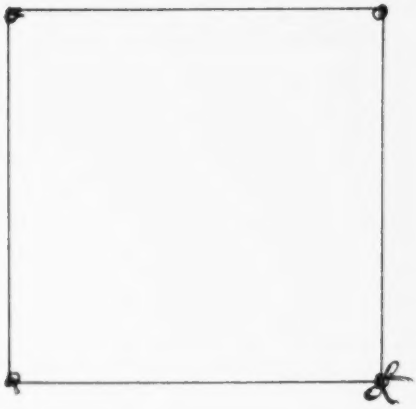


Throw a hoop on some leaf litter or on the forest floor.

What evidence of trees can you find?

Look for seeds, gumnuts, leaves — at different stages of decay.

Square metre study



Study a square metre with four metre strings in different forest areas.

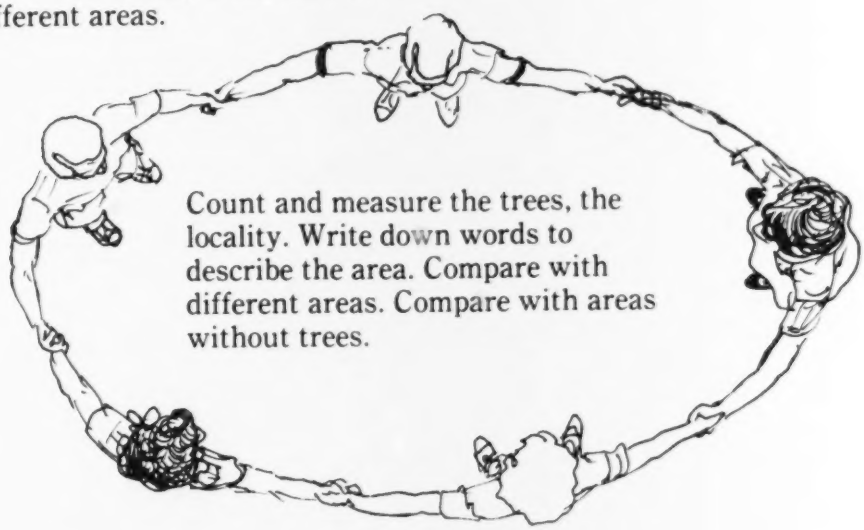
Compare — under trees

— in the gully

— on a slope

— bare areas without trees.

Make a human hoop with the class in different areas.



Count and measure the trees, the locality. Write down words to describe the area. Compare with different areas. Compare with areas without trees.

Look at the forest

Look for these layers in your bush areas.

How are the layers different?

Which layer gets the most light?

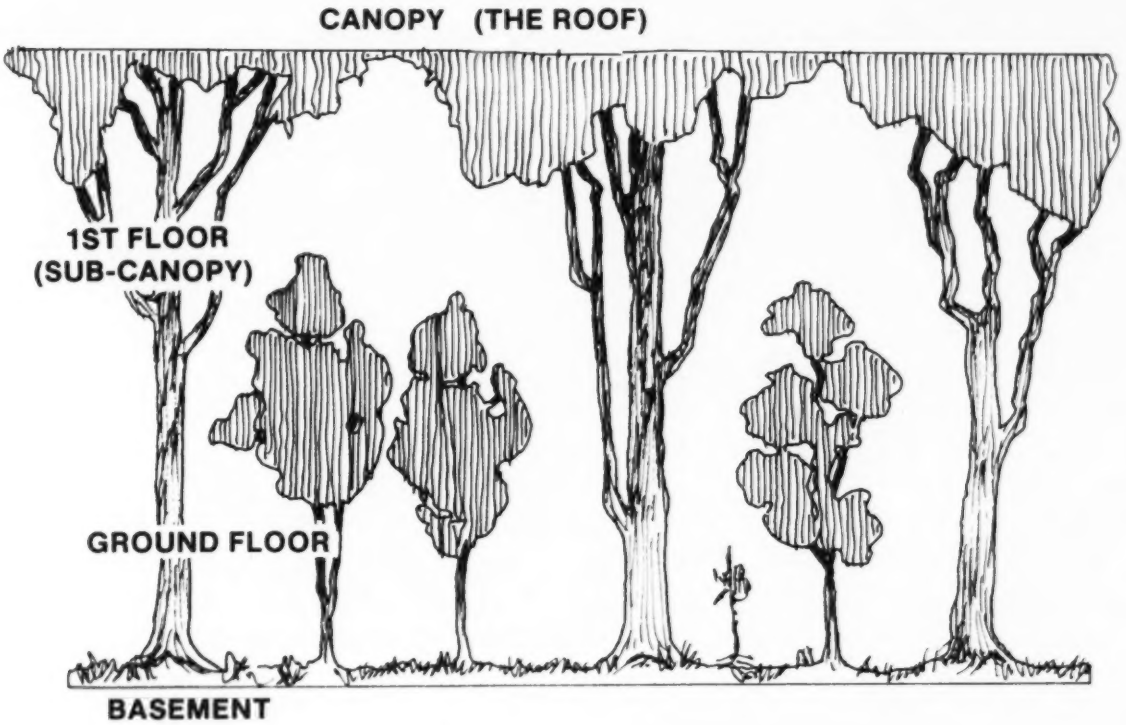
Which layer gets the least amount of light?

Compare the open areas to the shady areas.

Compare the forest to a field.

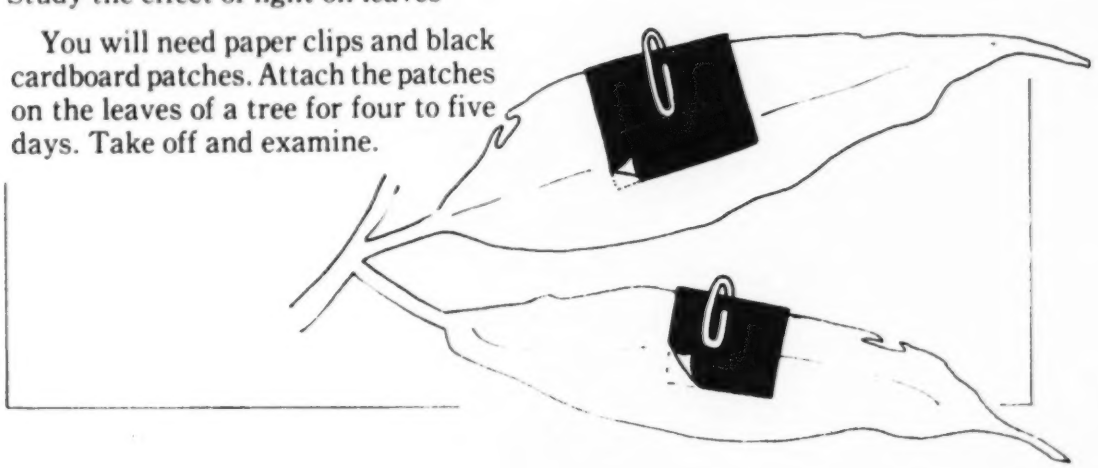
Examine the ground floor.

Look at your feet. Step aside — what are you stepping on? What have you squashed?



Study the effect of light on leaves

You will need paper clips and black cardboard patches. Attach the patches on the leaves of a tree for four to five days. Take off and examine.



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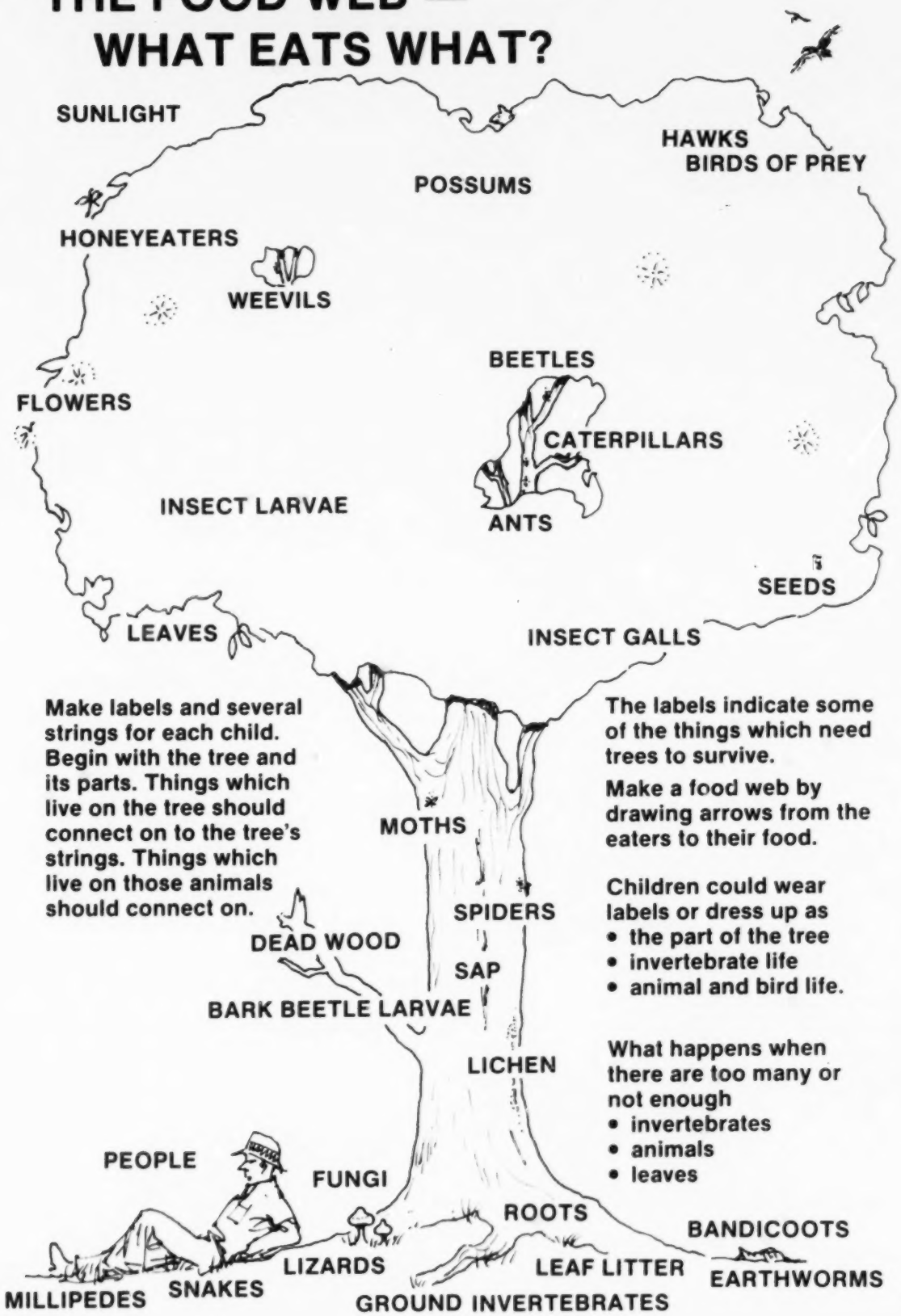
THE FOOD WEB — WHAT EATS WHAT?



Make labels and several strings for each child. Begin with the tree and its parts. Things which live on the tree should connect on to the tree's strings. Things which live on those animals should connect on.

The labels indicate some of the things which need trees to survive.

Make a food web by drawing arrows from the eaters to their food.

Children could wear labels or dress up as
- the part of the tree
- invertebrate life
- animal and bird life.

What happens when there are too many or not enough
- invertebrates
- animals
- leaves

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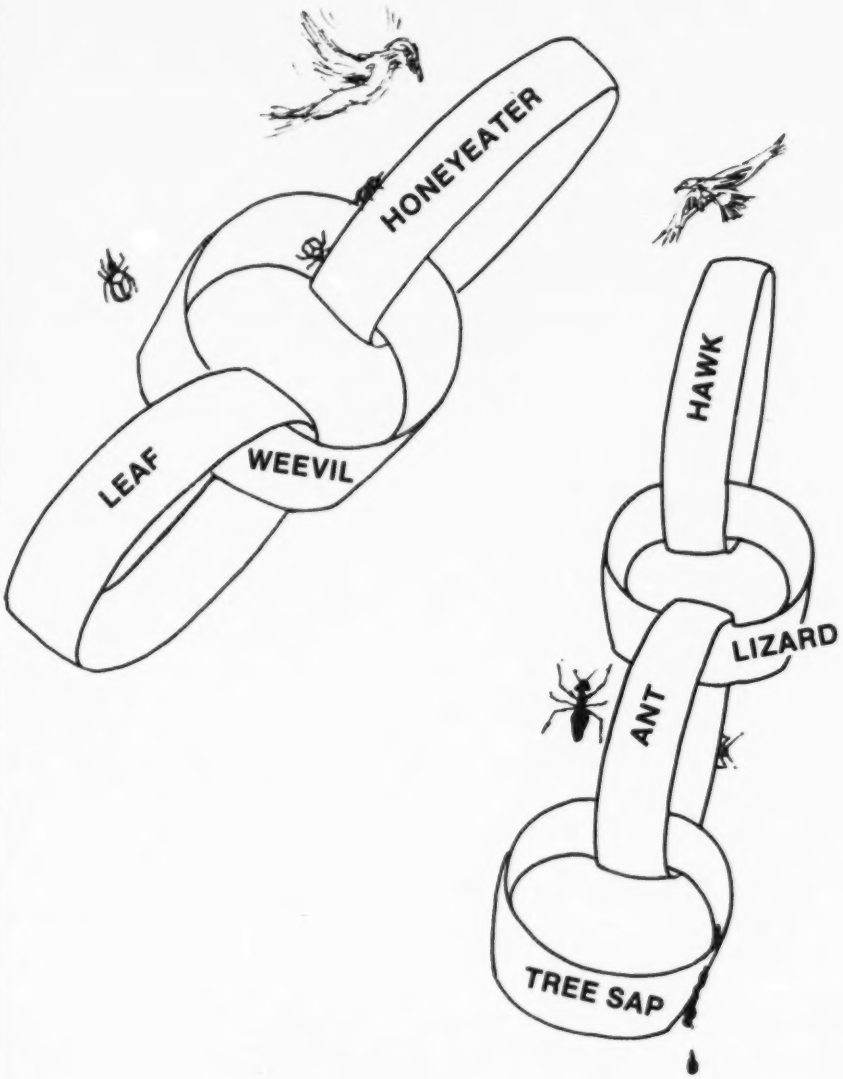
Animals are linked together by their need for food — by eating or being eaten. They all depend on each other and on trees, which often form the start of the chain.



Make paper chains to show some food chains you have observed. Alternatively, children may wear labels to indicate what they are and make human chains by linking arms.

GROW YOUR OWN PET TREE

You may have a pet dog, a pet cat or even a pet rock. You could grow your own pet tree or you could adopt one.

Keep a diary about your special tree, how tall it grows, when it flowers, what the flowers look like and any other changes which happen to it during the year.

Find out when it flowers, when most insects use it, and when the birds feed in it.

Collecting seeds

When collecting seed, you will need secateurs, strong paper bags and a pen.

Choose a fine day. Select a tree or bush with ripe fruit within reach.

Pods, nuts or capsules should not be green, but brown or greyish. No openings should be evident. There is an exception. Some pods such as those on wattles may open and the seed will stay attached.

If possible, find a number of the fruits on a twig and cut it cleanly, place in a paper bag, label clearly with the date and locality. Remember, only fruits of one tree in each bag.

Place bags in a warm, dry place such as a sunny window-sill for a week or two. Shake periodically to loosen the seed.

After a good final shake, tip the contents of the bag on to a sheet of white paper. Separate the seed from the pods, leaves, twigs, etc.

Unless you are going to plant immediately, package seed in envelopes. Seal around edges with tape. Name, date and the locality of the seed should be written on the envelope.

A pinch of derris dust (insecticide) will prevent insects such as weevils from hatching out and eating the seed.

Store the packet in a clean, dry container in a cool place such as the fridge (not the freezer) or plant immediately.

Some pods or cones may need heating in the oven if the 'paper bag in sunny window-sill method' does not work.

Plants such as banksias and hakeas release their seeds after fire. It may be necessary to imitate this by collecting cones and placing them on a tray in the oven at 185°C (350°F) for 30 minutes.

Alternatively, lightly burn them on a barbecue or open fire until the fruits begin to open. Repeat if necessary.

Plants which shed seed quickly after maturity, such as grevilleas, may be collected by placing a nylon stocking over the seed follicles (fruits) just before they start to ripen. This technique also can be useful for collecting wattle seeds.

Some seeds require heat treatment when sowing. A hard coating allows them to remain alive for many years.

Germination of these seeds is very slow. If water cannot get in to the seed, the young plant inside will not grow.

Wattle seeds and seeds in pods need treatment to hasten germination. Boiling water should be poured over the seeds, which should then be left to soak overnight until the seed coat swells.

Rubbing the seed coat with sandpaper also will help to break down the hard outer casing and let water in.

Gumnuts.

Sowing seeds

You will need a large nail, sand, loam and compost, peat moss (available from nurseries), clean containers such as those for margarine, yoghurt or ice-cream.

Holes should be made with a hot nail in the sides near the bottom of each container.

For best results your soil mixture should contain coarse sand to ensure the soil is well-drained and damp peat moss to prevent dryness.

To sterilise the soil, cook it in an oven at 80°C for one hour.

With fine seed, do not sow too thickly or fungus will kill the seedlings due to poor air movement. Mix them with some sand before spreading, or sprinkle them from a pepper shaker.

Large seeds should not be sown too closely or the roots will be disturbed when planting out. Large banksia seeds should be planted two to a container.

Cover the seeds evenly. A fine layer of gravel will stop any disturbance of the soil from watering.

Label the container with the name of the plant and the date the seeds were planted.

Water gently, using a fine spray, or stand the containers in a tray of water. Water is absorbed and rises by capillary action.

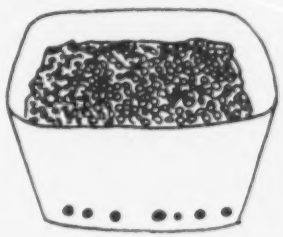
The water tray can be removed as soon as seeds germinate. Once the seeds have germinated they may be watered from overhead.

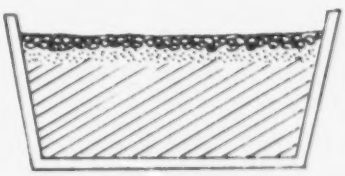
Spray with fungicide (Benlate) if fungus appears.

Place the container on a warm, north-facing window-ledge.

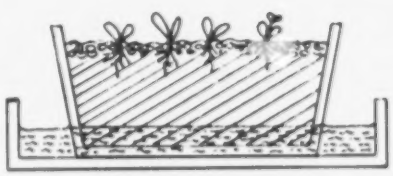
POTTING MIX

1 part sand
1 part loam or compost
1 part peat moss





fine gravel
3-5mm mix of sand and seeds



2cm water

Potting up

Seedlings should be transplanted into individual containers soon after the first true leaves appear.

Water them lightly, allow the containers to drain, then loosen them with a table knife or pointed ice-cream stick.

Remember — the soil must be moist, not dry. Dry soil breaks too many roots when you are lifting out the seedlings.

Hold each seedling by a leaf and put the young plant in a container part-filled with soil, then fill around the root to the top of the container with potting soil (as used before). Gently firm soil around the plant, taking care not to harm the stem.

Water well and place in a shady area away from draughts for at least a week. Label clearly.

Planting out

It is best to plant out seedlings when they are no more than 150mm high. Smaller planted seedlings quickly develop a deeper and stronger root system and are less likely to blow over in the wind.

If seedlings are not to be planted out, then it will be necessary to repot them when they become pot-bound — that is, when the soil in the pot becomes full of roots.

Seedlings are best planted out into the ground after the first rains of autumn. This gives them winter and spring to get established before the dryness of the summer (but beware of frosts).

In choosing a site, it should suit the tree — that is, do not plant a big forest tree such as a blue gum in the garden.

Dig a hole twice the width of the pot. Use a crowbar to make a ring of holes 15cm around the first hole, loosening the earth.

Free the seedling from the pot and loosen the roots and set the tree in the hole.

Fill with soft earth. Water around the ring of holes. Do not water the top of the tree. Place stones around the area of the hole. Water regularly.

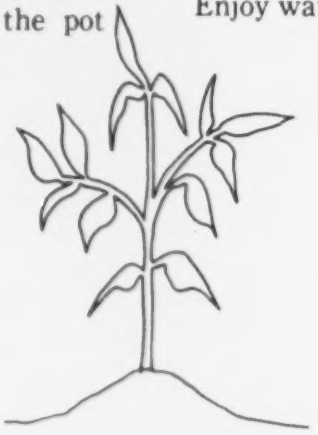
In dry areas make a hollow around the tree. In wet areas make a hill.

If the site you choose is a frosty or windy spot, make a shelter from a plastic bag. Leave a small gap at the bottom.

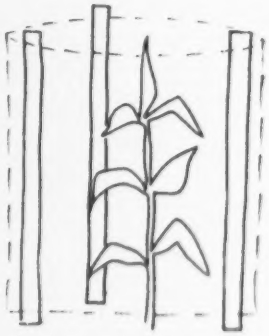
Mulching with newspaper, wood-chips, pine bark or gravel will help to keep the weeds in check and will retain soil moisture in dry weather.

Enjoy watching your trees grow.

Dry area planting out.



Wet area planting out.



Protection for a new plant.

ALTERNATIVE STARTING POINTS FOR INVESTIGATING WOOD

WOODEN OBJECTS

Display — such as pencils, spoons, breadboards, bowls, toys, carvings, driftwood, pegs, chopsticks, clogs, sawdust, charcoal, matches

USES

Why is it made of wood?

Uses of wood around the school

Community uses

transport
furniture
instruments
building

Visit to building site

PROPERTIES

colour
smell
texture
hardness
grain
mass
shape
size
floating/sinking — **water**
boats
rafts

woodwork activities

SOURCE

Timber trees —

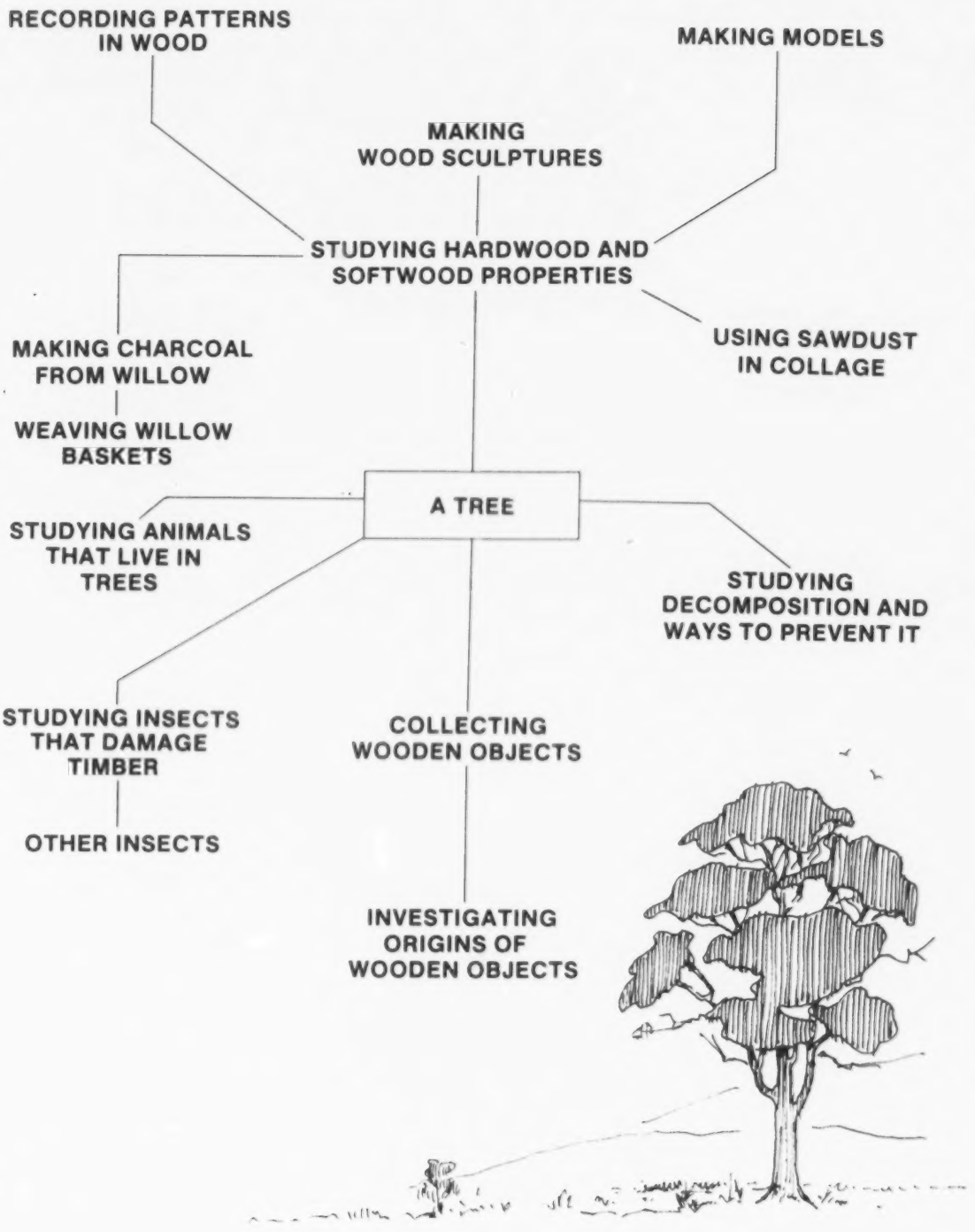
softwood, hardwood common timber

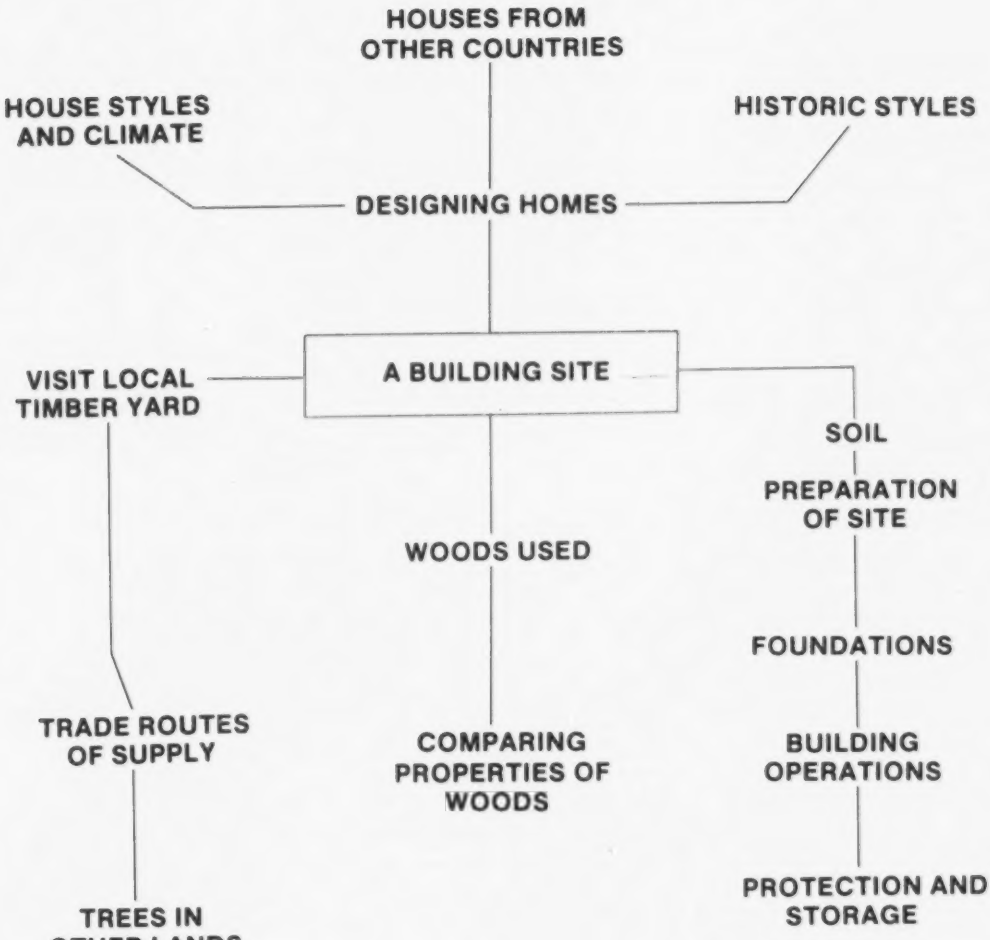
Local trees

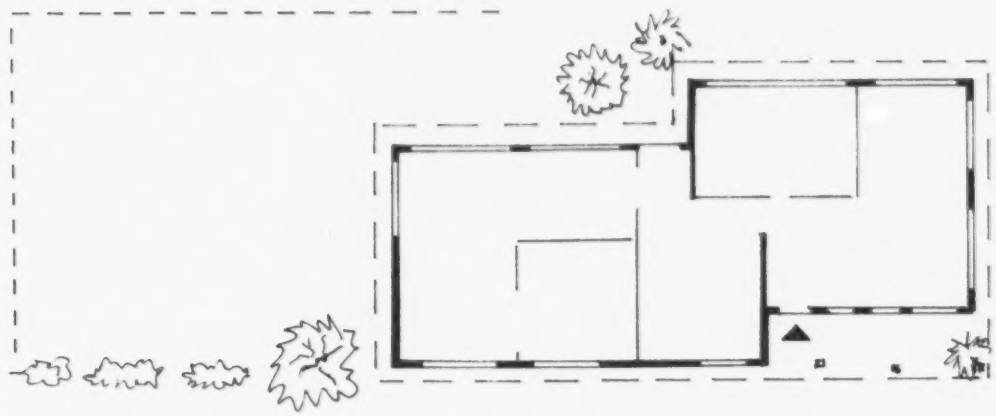
Visit a timber yard

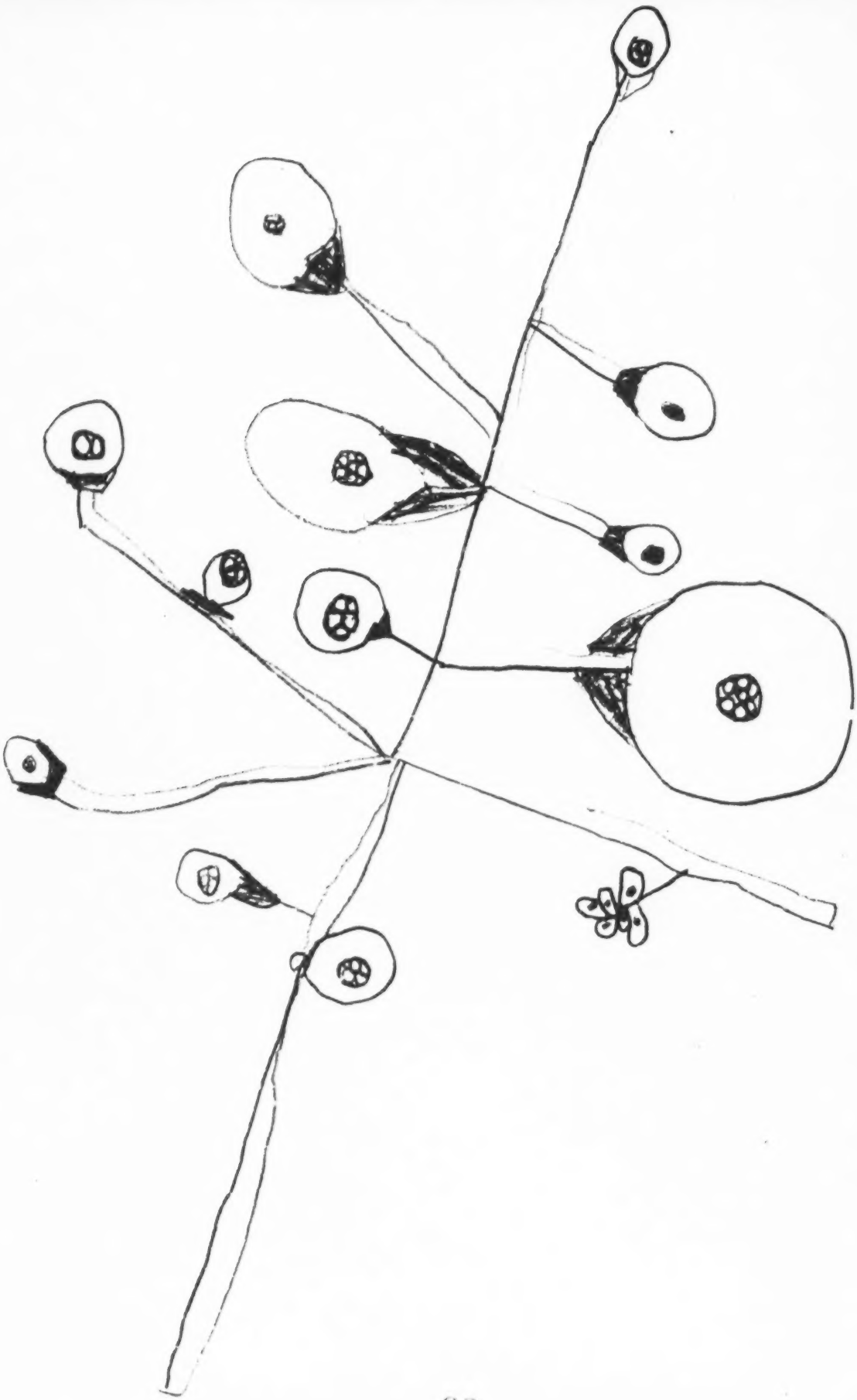
Woodsong video

A stand of pine trees suitable for a wide range of commercial uses.


RECORDING PATTERNS IN WOOD
MAKING MODELS
MAKING WOOD SCULPTURES
STUDYING HARDWOOD AND SOFTWOOD PROPERTIES
MAKING CHARCOAL FROM WILLOW
USING SAWDUST IN COLLAGE
WEAVING WILLOW BASKETS
A TREE
STUDYING ANIMALS THAT LIVE IN TREES
STUDYING DECOMPOSITION AND WAYS TO PREVENT IT
STUDYING INSECTS THAT DAMAGE TIMBER
COLLECTING WOODEN OBJECTS
OTHER INSECTS
INVESTIGATING ORIGINS OF WOODEN OBJECTS


HOUSES FROM OTHER COUNTRIES
HOUSE STYLES AND CLIMATE
HISTORIC STYLES
DESIGNING HOMES
A BUILDING SITE
VISIT LOCAL TIMBER YARD
SOIL
PREPARATION OF SITE
WOODS USED
FOUNDATIONS
TRADE ROUTES OF SUPPLY
COMPARING PROPERTIES OF WOODS
BUILDING OPERATIONS
PROTECTION AND STORAGE
TREES IN OTHER LANDS





RESOURCES

POOL TYPE OF RESOURCE	TITLE/AUTHOR OR PUBLISHER	DESCRIPTION	USE	WHERE TO FIND IT
Posters	*Plants* Our World Wall-charts	Pack of four botanical descriptions	K-6	SRL Pool State Library, 3rd Floor
Books	*The Tremendous Tree Book* Mary Garelick	Celebrating trees	K-6	SRL Pool State Library, 3rd Floor
	A Tree Hurts Too US Department of Agriculture	Tree illnesses, infections, decay injuries, well diagrammed to illustrate	2-6	SRL Pool State Library, 3rd Floor
	A Tree is Nice Janice Udry	Stories and illustrations	K-2	SRL Pool State Library, 3rd Floor
	Farmer Barnes Fells a Tree John Cunliffe	Story and Illustrations	K-3	SRL Pool State Library, 3rd Floor
Filmstrips	*Stephen's Tree* (Italian version) Libby Hathorn		Eng. K-3 2-6	SRL Pool State Library, 3rd Floor
	The Tree Pamela Nosh	See How It Grows series — botanical	K-3	SRL Pool State Library, 3rd Floor
	Trees Visual Books Macdonald	Very good reference first trees, pollination, forest planting myths and legends, paper-making, grafting, etc.	2-6	SRL Pool State Library, 3rd Floor
Filmstrip and kit	*Plant Diversity* Pic-a-Pak 213	30 colour filmstrips and notes	1-6	SRL Pool State Library, 3rd Floor
KITS	*A Look at Plants* Wonders of Learning	OHP transparencies, charts	3-6	SRL Pool State Library, 3rd Floor
	817-A Plants Instructor	OHP transparencies, parts of plants, etc.	3-6	SRL Pool State Library, 3rd Floor

POOL TYPE OF RESOURCE	TITLE/AUTHOR OR PUBLISHER	DESCRIPTION	USE	WHERE TO FIND IT
	Threatened Plants of the Tasmanian Central East Coast J.B. Kirkpatrick, M.J. Brown A. Moscal	A Tasmanian Conservation Trust study which states the problem and suggests strategies for species conservation.	Teacher reference	State Library
	Students Flora of Tasmania (Vols 1-3) Winifred M. Curtis	Technical, botanical description of plants, keyed.	Teacher reference	State Library
	Forest and Flowers of Mt Wellington, Tasmania Winifred M. Curtis	Tas. Museum & Art Gallery production detailing flora in a readable manner.	5-6 Teacher reference	State Library or Museum
	Flowers and Trees of Australia Australian Government Publishing Service	Colourful plates, simple descriptions of a range of species	5-6, Teacher reference or pictorial display	State Library
	Trees of Australia H. Oakman	Pocket-book guide to a range of species suitable for excursions. Describes habitat, size, timber, general notes.	5-6 Teacher reference	State Library
TREES POSTER POOL	*Forest Trees of Australia* Forest and Timber Bureau	Photographs, detailed botanical illustrations	2-6 Teacher reference or upper primary	State Library
	Handbook of Trees and Shrubs for the Southern Hemisphere Richmond E. Harrison	Technically detailed lists of plant orders and species.	Teacher reference	State Library
	Look at Trees Edith Bone	The story of man learning to. use trees	2-6	State Library
	The First Book of TREES M.B. Cormack	A Northern Hemisphere look at trees	4-6	State Library

POOL TYPE OF RESOURCE	TITLE/AUTHOR OR PUBLISHER	DESCRIPTION	USE	WHERE TO FIND IT
	A First Look at TREES Robin Kerrod	Very clear illustrations with introduction to botanical terms. Northern Hemisphere varieties.	3-6	State Library
	Things to Do with TREES Millicent E. Selsam	Growing from seeds, the vascular system, buds, tree rings, pressing leaves, mounting collections	K-6	State Library
	Trees and How We Use Them Tillie S. Pine, Joseph Levine	The importance of leaf, seed, bark, trunk, root in exploring the growth of trees and how they help us in all kinds of weather. Includes simple experiments.	2-6, Teacher reference	State Library
	Trees and Timbers Herbert L. Edlin	Very detailed explanations to assist with projects in learning about trees, with simple experiments about measuring height, volume and girth. Naming trees is noted, also how to handle specimens.	5-6	State Library
	Trees for Use and Delight Rosemary and Penelope Ellis	Clear photographs, text refers to growing trees, use of wood, people and trees.	3-6	State Library
	Tree Wonders of Australia A.E. Books	How to identify different species including palms. Food and drugs from trees.	Teacher reference	State Library
	Australian Trees: A guide to Their Care and Cure P.W. Haddington, J.A. Johnston	A tree lover's first aid book with useful illustrations and photographs	Teacher reference	State Library

POOL TYPE OF RESOURCE	TITLE/AUTHOR OR PUBLISHER	DESCRIPTION	USE	WHERE TO FIND IT
	A Field Guide to ... (Series of books) Ivan Holliday, Geoffrey Watton	Books suitable for using as identification during excursions. Follows Australian plants	Teacher reference	State Library
	Trees: Ideas for an Australian Classroom Education Department, Hobart	Multicultural stories about trees	Teacher reference	Curriculum Centre,
BOOKS				
	Trees Stages 1 & 2 McDonald Educational Publishers	Science 5/13 Project	Teacher reference	Southern Teachers Centre maths/ science resource
	Australian Trees and Shrubs ANU Press	Large colourplates with brief descriptions	K-6	ANU Press 169 Phillip Street WATERLOO NSW 2017
	Australian Banksias Douglas Baglin, Barbara Mullins	Soft cover with good description, colourplates	P-6	A.H. & A.W. Reed 53 Myroora Road, TERRY HILLS NSW 2084
	Australian Eucalypts Douglas Baglin, Barbara Mullins	Soft cover with good description, colourplates	P-6	A.H. & A.W. Reed 53 Myroora Road, TERRY HILLS NSW 2084
	Australian Wattles Douglas Baglin, Barbara Mullins	Soft cover with good description, colourplates	P-6	A.H. & A.W. Reed 53 Myroora Road, TERRY HILLS NSW 2084
	Australian Native Gardens and Birds Barbara Salter	Black and white pictures with details about trees and shrubs which can be grown to attract native birds	2-6	Ure Smith 176 South Creek Road DEE WHY NSW 2099

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	Explore a Spooky Swamp Wendy Cortesi	National Geographic Society publication which gives the ecological view of swamp life, plant and animal	4-6	Bookshops
	Through a Magic Glass Solveig P. Russell	A microscopic look at a tree to discover facts about its growth, chemistry and other botanical features	4-6	Bookshops
PERIODICALS	*Your Garden* Argus and Australasian Ltd Publishers	Magazine	All age groups: specific articles June 1982	Newsagents, $1 per copy
FILMS, VIDEOS, FILMSTRIPS				
Film, 12 minutes	*Forest Produces* USA 1949	The essential role the forest plays in providing us with water; the ways water is used and the forest as a source of wood, relaxation and interest. Points out that if humans destroy the forest they will destroy themselves by so doing. Shows good overall picture of importance of trees.		State Library
Film, 18 minutes	*Foresters Island* 1973	Shows changing aspects of the timber industry in Tasmania and how the production of high-grade paper, newsprint, veneers and plywood, and finally the large-scale woodchip export industry, has assisted forest management by effectively using all grades of timber.		State Library
Film, 32 minutes	*On the Edge of the Forest.* Schumacher 1977	The last film made by this world-renowned economist, broadcaster, lecturer and author of *Small is Beautiful*. Filmed in the unique jarrah and karri forests of Western Australia.		Tasmanian Wilderness Society

POOL TYPE OF RESOURCE	TITLE/AUTHOR OR PUBLISHER	DESCRIPTION	USE	WHERE TO FIND IT
Film, 30 minutes	*The Fate of the Forests* Island Films 1982	Comprehensive factual account of Tasmanian rainforests with brief histories of various aspects including Queenstown and Tasmanian tiger. Shows the rapid destruction that is taking place.		Tasmanian Wilderness Society
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Filmstrip, tape and notes	*A Tree for Me* USA 1973	Jeremy finds out that city trees need special care if they are to become strong and healthy. He decides to help a distressed tree		Tasmania Media Centre K 291
Filmstrip and tape	*The Wonders of Nature — Trees* USA 1970	Animated treatment of trees from seeds to full growth		Tasmania Media Centre K 426

POOL TYPE OF RESOURCE	TITLE/AUTHOR OR PUBLISHER	DESCRIPTION USE	WHERE TO FIND IT
Filmstrip and tape	*If I Were a Tree* USA 1975	Listener asked to imagine what it would be like to be a tree	Tasmania Media Centre K699
Filmstrip, tape and two booklets	*The Apple Tree* Nat. Geog. 1980	Describes the plant, insect, bird foodchain.	Tasmania Media Centre K1045
Film, 14 minutes	*Trees — Our Plant Giants.* USA 1960	Interesting and comprehensive film about the plant giants from their beginnings as seeds to all their various uses and their importance to man	Tasmania Media Centre J1899
Film, 13 minutes	*Leaves of Green* Aust. 1977	Basic botany film using live action and time-lapse photography to show benefit of leaves to life on earth; leaf modification, structure and arrangement	Tasmania Media Centre J2530
Film, 24 minutes	*The Living Forest* Aust. 1973	Man depends on forests as a source of water and also uses the forests' timber for building, fuel and making paper.As the population expands, so do the demands being made on forests to provide living space and forest products. In this eucalypt forest we are introduced to a vast variety of animals, birds, insects and plant life dependent in some way on one another.	Tasmania Media Centre
Film, 15 minutes	*Around the Gum Tree* Aust. 1952	The gum tree, indigenous to Australia, shown in many of its various forms in the different types of country which govern its development, with emphasis on the importance of tree conservation.	State Library
Film, 15 minutes	*About Trees* Aust. 1956	Australian trees are shown in their natural surroundings and the danger of exploitation of trees by felling is pointed out.	State Library